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Soviet Spending for Defense: Trends Since 1951 and Prospects for the 1980s

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An Intelligence Assessment

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An Intelligence Assessment

Information available as of 9 October 1981 has been used in the preparation of this report.

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This paper was prepared by
of the Office of Soviet Analysis. The text is essentially that of the version originally issued in November 1981.
Comments and queries are welcome and may be directed to the Chief, Econometric Analysis Division, Office of Soviet Analysis,

This paper has been coordinated with the National Intelligence Council.

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Key Judgments

The dominant feature of Soviet defense spending over the past 20 years has been the persistence of its growth. Since 1965, the growth has averaged about 4 percent a year—about the same as that for the overall economy. Over most of this period, the defense share of GNP was a relatively constant 12 to 13 percent. In 1979 the share increased by a percentage point.

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This 20-year commitment of resources to the Soviet defense effort has paid substantial dividends in political prestige and military power, but it has drawn scarce human and technical resources and raw materials from the economy. In specific sectors that are key to economic growth—machinery, fuels, power, and chemicals—the Soviet military requirement has been even higher than the one-eighth share that defense takes from the economy as a whole.

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Resource commitments to these areas will be increasingly important to the economy as demographic and energy problems combine with longer standing difficulties to retard economic growth. Under these conditions, maintaining historical rates of growth in defense spending will be economically and politically more difficult.

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If defense spending continues to grow at about 4 percent per year and economic growth continues to decline, the defense share of GNP could increase to 15 percent by 1985 and could approach 20 percent by the end of the decade. This would drastically reduce the extent to which additional resources could be allocated to investment and consumption. It would also erode future increments to GNP that have been so important in the past in easing political tensions that arise from the competition for resources. Indeed, it appears that the preparation of the 1981-85 economic plan has involved particularly difficult decisions on the allocation of resources between defense and the other sectors of the economy. Despite such factors, we have seen no indications of a shift of resources away from the defense sector.

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On the basis of observed military activity—the number of weapon systems in production, weapons development programs, and trends in capital expansion in the defense industries—we expect that Soviet defense spending will continue to grow at about its historical rate through at least 1985. In this connection, however, a deputy chairman of the Soviet State Planning Committee (Gosplan) told a former US budget official in May

Secret
SOV 82-10059
April 1982

1981 that the Soviet Union had been adjusting its 1981-85 economic plan to accommodate "large increases" to the military. These increases allegedly were intended to counteract US defense budget increases and, according to this official, required important revisions in plan targets. 25X1

If the Soviets have adjusted their 11th Five-Year Plan to accommodate "large increases" in defense activities, such increases would almost certainly be related to the production of military hardware. Opportunities for immediate increases could well be limited by chronic bottlenecks in the supply of components and materials. In the short run, therefore, Soviet adjustments to increase military production would probably be limited to two courses of action: modest increases in production rates for some selected systems already in or about to begin production, or the extreme measure of industrial mobilization. Longer term options include increasing investment in the defense industries to expand their capacity to produce military systems in the mid- and late 1980s and adding new development programs to those already planned. 25X1

Large increases in Soviet defense activities probably would be directed primarily against what the Soviets may perceive as an accelerating arms competition with the West. Since March 1981 the Soviets have apparently become less hopeful about the prospects of achieving arms control agreements with the United States and more concerned about how to preserve Moscow's military-strategic position. With this perspective, the Soviets would probably pursue a combination of near-term production increases for selected systems and longer term increases in investment and developmental activity to hedge against what in their view is an increasingly uncertain strategic environment. 25X1

If the Soviets pursued these options, defense spending would probably grow above historical rates in the mid- and late 1980s and beyond. In the near term, investment in some civilian sectors would suffer. Cutbacks probably would occur in such areas as consumer durables, services, housing, and machinery and equipment for the food and soft goods industries. Such cuts would worsen already poor prospects for improving labor productivity over the next five years and could increase worker discontent. Despite these consequences, we believe the Soviet leadership would be inclined to continue the current mix of cosmetic concessions, short-term fixes and patriotic appeals and, if necessary, to adopt repressive measures to ensure both continued growth of their defense effort and domestic control. 25X1

We would detect indications of large increases in Soviet weapons development and production programs well before such weapons became operational with Soviet forces. The best indicators would be higher levels of weapons testing activity and increased capital construction at key weapons production facilities. Specific testing programs and plant expansion projects would probably provide several years' advance warning of changes in the mix and levels of weapons the Soviets intend to acquire later in this decade.

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Contents

25X1

Figures

Tables

Soviet Spending for Defense: Trends Since 1951 and Prospects for the 1980s

25X1

Introduction

A priority intelligence issue is the impact that a deteriorating economy will have on Soviet military and foreign policies during the 1980s. In the second year of their 11th Five-Year Plan (1981-85), Soviet leaders are facing a continuation of the dismal economic picture of the past few years, as well as the prospects of invigorated defense programs in the West. A key consideration in assessing future directions in Soviet military policy and programs is an understanding of past trends in the Soviets' resource commitment to defense.

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Toward this end, this paper places Soviet defense spending between 1951 and 1980 in its military, political, and economic setting. The paper begins with an overview of trends in Soviet defense expenditures over the past 30 years. It next addresses the general factors that have shaped military forces and outlays over this period, such as technical developments, changing military policy, and political leadership. Then, the economic environment within which the Soviet military has developed is analyzed. Finally, an estimate of the trend in Soviet defense spending during the 1980s is given.

The Soviet defense program analyzed in this paper is defined broadly to include some activities that the Soviets may define as defense related but the United States does not—for example, the type of space programs that are carried out by NASA in the United States. The estimates of defense spending are based for the most part on a detailed identification and direct costing of the activities and components that make up the Soviet defense program for each year.

The estimates are expressed in rubles to reflect our understanding of the costs of military activities in the USSR. Such estimates help us assess the resource commitment and the relative priorities assigned to the forces that make up the defense effort, and the impact of defense on the economy.

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By using constant prices, our estimates reflect only real changes in defense activities and not the effects of inflation. Because of the peculiarities of the pricing system that the Soviets use, we know that their prices reflect real resource costs only in the years immediately following a major price reform. The last such reform began in 1966-67 and was fully implemented by 1970; therefore we use 1970 prices in all our analyses of Soviet defense expenditures.

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The Soviets are once again engaged in a major price reform to make their prices reflect real resource costs. This reform is scheduled to take effect in 1982. We anticipate that gathering sufficient intelligence on the price reform and analyzing this information to change the price base year will be a long-term, resource-intensive task.

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If a more recent price base were used, the level of expenditures would be higher, reflecting growth in the price levels of military goods and services. The share of GNP going to defense, however, would not necessarily be higher. This would depend on the differential between inflation rates for defense and for GNP as a whole.

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General Expenditure Trends

Total Spending

Analysis of the levels and trends in total Soviet defense expenditures [1] between 1951 and 1980 reveals three distinct periods (see figure 1). [redacted]

Between 1951 and 1955, the trend in defense expenditures was dominated by a dramatic increase in 1955 because of large aircraft procurement programs for air defense and strategic attack. During this period, the Soviet armed forces were structured primarily for the type of combat experienced during World War II and were characterized by large tactical aviation and ground forces formations. [redacted]

During the mid- and late 1950s, the Soviet force structure began to change in response to an evolving nuclear doctrine. Emphasis shifted from the maintenance of large general purpose forces to smaller forces equipped with newly developed missiles and streamlined for the nuclear battlefield. Military manpower was cut back substantially, and an absolute reduction in Soviet military outlays occurred, which amounted to almost 4 percent a year. [redacted]

This declining trend was reversed in 1960 as Soviet defense expenditures began two decades of steady increases. The years 1960-65 represent the highest growth years, reflecting growing resource commitments to research, development, testing, and evaluation (RDT&E), space programs, and strategic forces. During this period, defense was growing at about 8 percent a year while the rate of economic growth declined to between 4 percent and 5 percent annually because of a slowdown in industrial productivity and the disastrous harvest of 1963. [redacted]

[1] The analysis in this report is based on a broad definition of Soviet defense expenditures which includes activities that the Soviets may define as defense related, but which are not included within the US definition of defense. These include expenditures for internal security forces, construction and railroad troops, and the type of space programs that are carried out by the military in the USSR, but by NASA in the United States. [redacted]

Figure 1
Estimated Soviet Defense Expenditures, 1951-80

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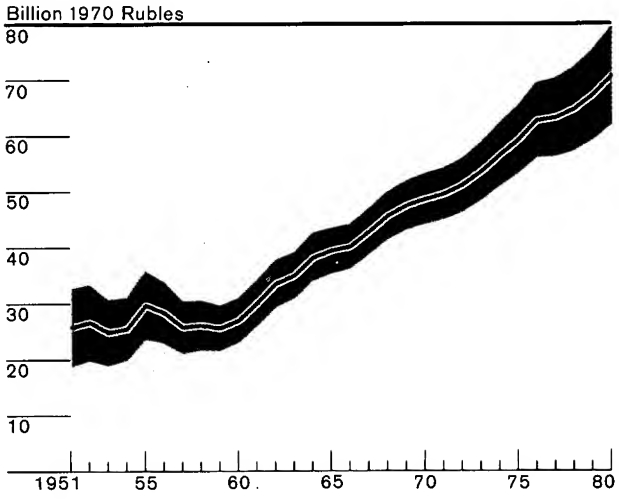

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The expenditures in this graph, expressed in 1970 rubles at factor cost, are based on a broad definition of Soviet defense expenditures which includes activities that the Soviets may define as defense related but which are not included within the US definition of defense. These include expenditures for internal security forces, construction and railroad troops, and the type of space programs that are carried out by the military in the USSR but by NASA in the United States. The shaded area represents a confidence interval around the estimate for each year. We believe there is only a 10-percent chance that the "true" figure for any given year lies outside the shaded area.

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[redacted]

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The relationship of defense growth to economic growth changed after 1965. From 1965 to 1978, Soviet defense expenditures grew at roughly the same average rate as the economy—about 4 percent per year. [redacted]

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Recent trends in Soviet defense spending and the economy suggest that defense expenditures may be returning to the relationship of the early 1960s, when growth in military outlays exceeded economic growth. The implications of these trends for Soviet defense spending in the 1980s are discussed in this paper. [redacted]

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Analysis of Expenditures by Resource Category

Defense spending can be divided into three principal resource categories: operating, investment, and RDT&E. The operating category includes expenditures for personnel as well as for the operation and maintenance (O&M) of current forces. Investment expenditures are those associated with acquisition and capital (major) repair of weapons, equipment, and facilities. RDT&E resources are used to explore new technologies, develop new weapons, and improve existing weapons.

Operating

Personnel. The Soviet system of military compensation is structured to retain and motivate career personnel while providing minimal support for conscripts fulfilling their terms of service. Because most of the USSR's military personnel are low-paid conscripts (see figure 2), the approach the Soviets use for personnel compensation enables them to keep their total payroll low.

Since the mid-1950s, personnel expenditures as a share of total defense expenditures have been steadily declining from a high of about 30 percent during 1951-55 to its present share of about 12 percent. Soviet personnel costs dropped in real terms by more than 30 percent during the 1950s, reflecting manpower reductions between 1953 and 1960 that totaled 2.2 million men. These expenditures began to rise in 1962 and increased rapidly from 1966 through 1970 during the buildup along the Sino-Soviet border. This growth slowed down during the 1970s.

O&M. Since 1965, the cost of operating and maintaining the Soviet armed forces has been increasing more rapidly than personnel costs (see figure 3). This trend is a result of the forces' weapons-intensive orientation, the Soviets' conservative approach to maintenance, and the increasing complexity of the advanced weapons deployed, which have required continually increasing maintenance and support costs.

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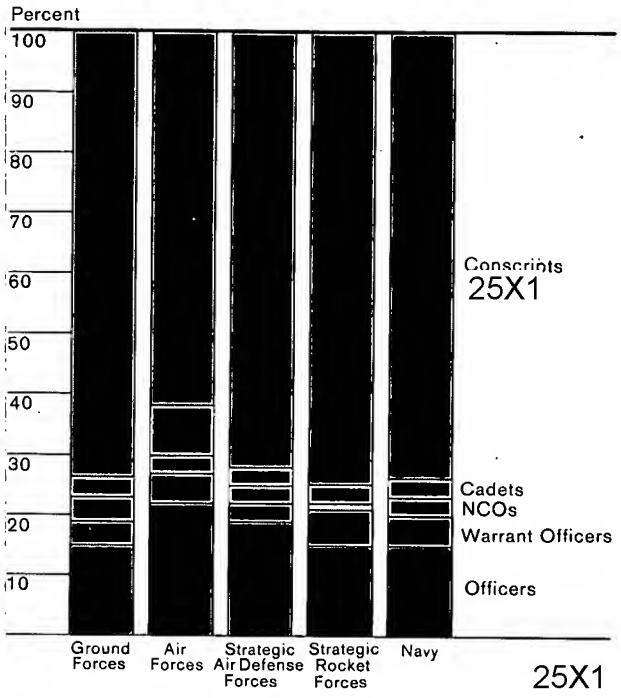
Figure 2
Rank Distribution of Soviet Military Personnel, by Service



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An illustration of the impact of Soviet maintenance practices on defense spending is provided by the system they have established for military aircraft.[3] Of all Soviet maintenance requirements, military aircraft maintenance appears to carry the highest price tag. Although the ruggedness and technical simplicity of most Soviet military aircraft tend to make them relatively easy to maintain, the conservative Soviet approach to maintenance, with its emphasis on frequent and extreme overhauls, makes the system costly: 25X1

- Our ruble estimates indicate that the annual cost of military aircraft maintenance has nearly doubled since 1969—rising at an average rate of over 5

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Figure 3
Trends in Soviet O&M and Personnel Expenditures, 1951-80

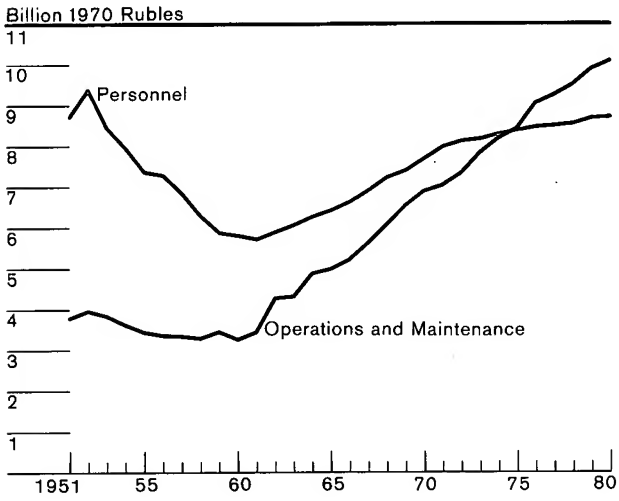

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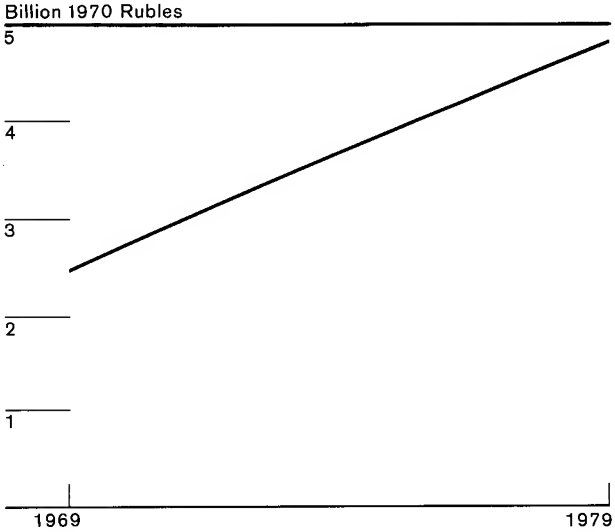
Figure 4
Estimated Costs of Soviet Military Aircraft Maintenance, 1969-79 (rubles)



The trend depicted has been smoothed.

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percent annually (see figure 4). This rapid increase has resulted from a steady growth in the Soviet inventory of technically more complex aircraft.

- Expressed in terms of dollar costs as paid by the US Department of Defense, maintaining the Soviet military aircraft inventory as the Soviets do would have cost the equivalent of $6-7 billion in 1979. This is roughly double the amount it would have cost the US Air Force to maintain (with current US methods) a similar fleet in the United States—that is, one with comparable numbers of aircraft, technical characteristics, and operating rates (see figure 5).

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Investment

The investment category is divided into two components: the procurement of weapons, equipment, and space systems, and the construction of military facilities.

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Construction. Construction as a share of total estimated Soviet defense costs rose in the 1960s, peaked in 1970 at about 7 percent, and declined to about 4 percent in 1980.

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During the 1960s, cumulative construction expenditures were more than two and a half times what they had been during the 1950s, reflecting an expanding Soviet military establishment (see figure 6). These increases were driven during the early and mid-1960s by the construction of airfields and facilities associated with SAMs, ABMs, and ICBMs. In the late 1960s, construction resources were shifted from facilities supporting strategic weapons to facilities for general purpose forces and support organizations to provide the logistical support for a global military power and the facilities for the conventional forces buildup along the Sino-Soviet border. Construction activity during the 1970s shifted away from building facilities that directly support weapons and personnel (for example, silos, runways, and barracks) to the construction of facilities that increase the combat readiness and

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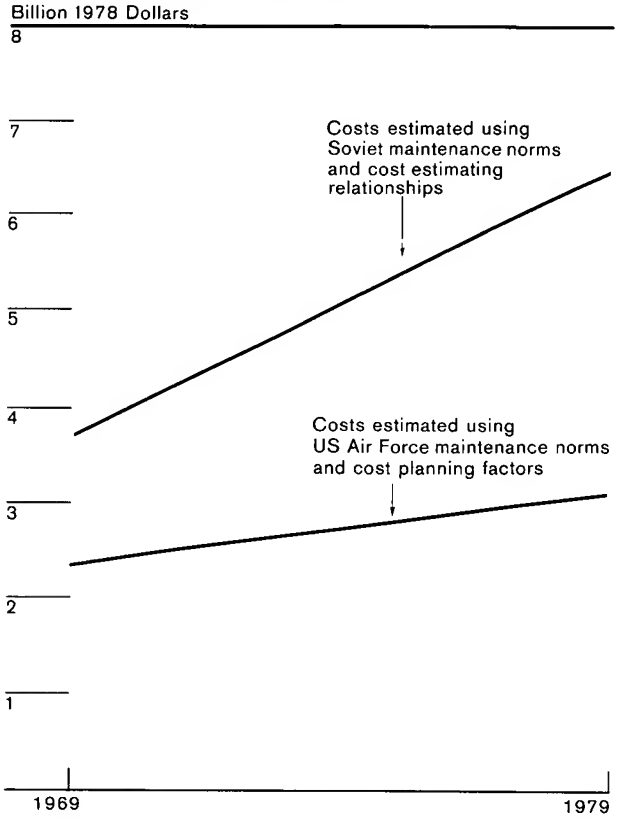
Figure 5
Estimated Costs of Soviet Military Aircraft Maintenance, 1969-79 (equivalent 1978 US dollars)



The trends depicted have been smoothed.

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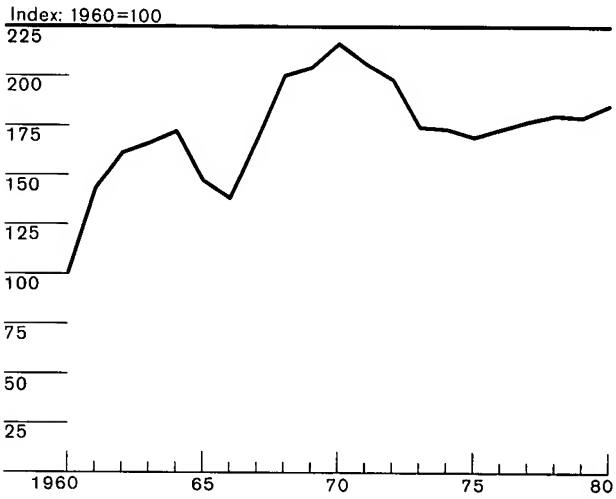
endurance of military units (for example, personnel support structures, maintenance buildings, and equipment, vehicle, POL, and ammunition storage facilities) and to the qualitative improvement of existing facilities. 25X1

The slowing pace of construction and the shift to qualitative improvement of facilities suggest that the Soviets now have a stock of military facilities that the Ministry of Defense considers adequate to support the essential missions of the armed forces. We estimate

Figure 6
Growth in Soviet Military Construction, 1960-80



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that future construction will focus primarily on qualitative improvements to facilities for logistical support as well as additional facilities to support the deployment of new weapons programs. 25X1

Procurement. Over the past 30 years, procurement has accounted for well over 90 percent of expenditures in the investment category and has been the major factor driving defense spending upward. Since 1965, the share of weapons and space procurement has been about 50 percent of total defense spending.

In the early and mid-1950s, large procurement programs for tactical aircraft as well as medium and heavy bombers dominated total defense spending. In the early 1960s, emphasis in procurement shifted to the rapidly expanding space program as well as strategic systems. Since the mid-1960s, the steady rise in procurement outlays has followed a general expansion of all Soviet forces and a rising trend in the unit

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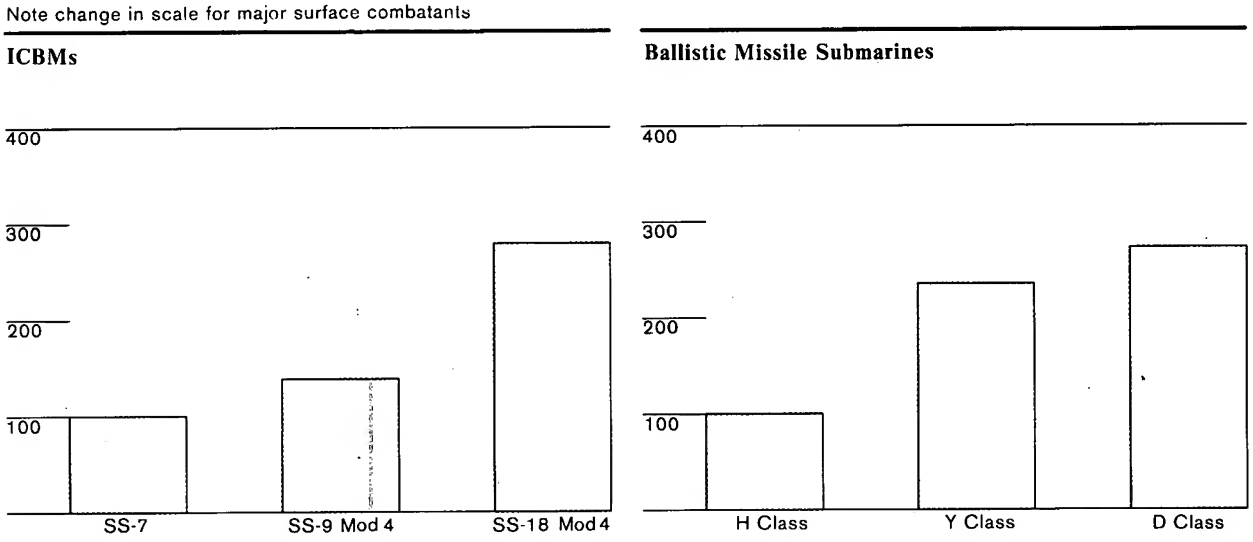
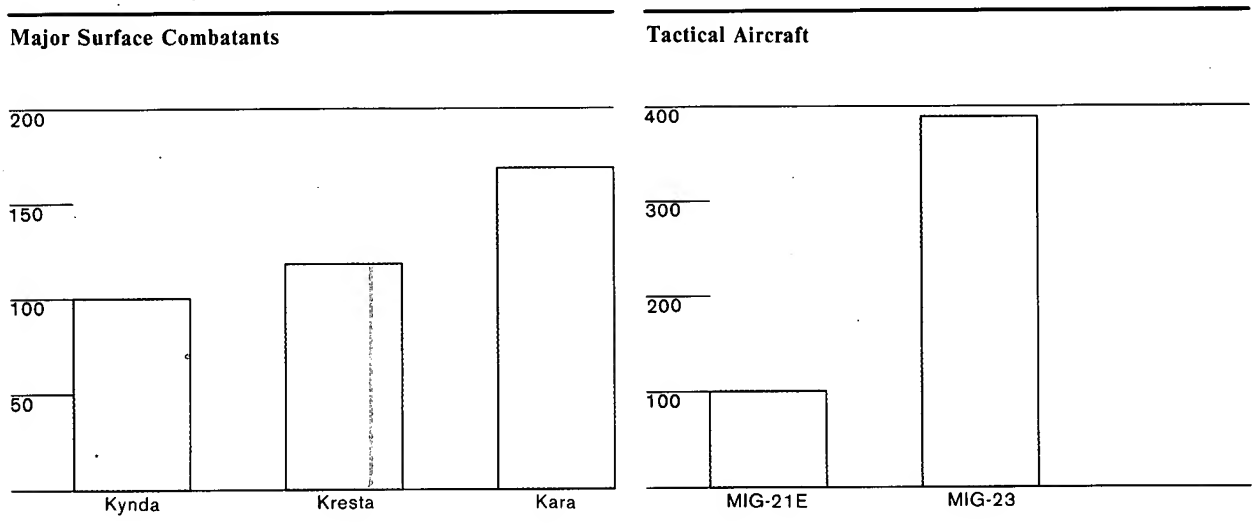
Figure 7

Trends in Unit Costs of Soviet Weapon Systems[a]

Note change in scale for major surface combatants





[a] Calculated on basis of initial unit cost in 1970 rubles; the first entry in each category is indexed to 100.

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costs of Soviet weapon systems (see figure 7). Increasing unit costs, in turn, reflect the fact that Soviet military programs have shifted more and more toward advanced technology. 25X1

Analyzing major weapons procurement programs [4] can provide insights into Soviet defense spending and military force structure. Comparing the number of major procurement programs and the weapons mixes in different periods of time reveals trends in total defense activities as well as shifting priorities in weapons acquisition. 25X1

Over the 30-year period, both the number and the variety of major weapon programs have increased:

- From 1951 through 1965, the Soviets engaged in 29 major weapons procurement programs. The 20 most costly programs made up half of total procurement costs. During 1965-79 the Soviets engaged in more than 40 major weapons procurement programs. The 20 most costly weapons programs (see table 1) made up one-third of the procurement total.

- In the 1951-65 period, aircraft accounted for 15 of the 20 most costly programs and dominated procurement, particularly in the 1950s. Tactical and air defense aircraft alone made up more than one-fifth of total procurement expenditures, and strategic attack programs, intended to deliver nuclear weapons to intercontinental ranges or to strategic targets on the periphery of the USSR, made up another fifth of total procurement. The most costly program was a strategic system—the Badger medium bomber. No major land arms programs for the Ground Forces were included.

- In the 1965-79 period, the 20 most costly programs included a greater variety of weapons for a wider range of strategic and theater warfare missions. In terms of expenditures, the largest Soviet procurement program was the Flogger fighter, which is currently in service with both Frontal (tactical) Aviation and the National Air Defense Forces. Five other tactical and air defense aircraft were also in the top 20. These six programs together accounted for almost 15 percent of total weapons procurement expenditures. Also important were strategic attack systems, including two nuclear-powered ballistic missile submarines (SSBNs), four ICBMs, one IRBM, and one bomber (the Backfire). These eight systems accounted for nearly another 15 percent of procurement spending, enhanced Soviet capabilities to attack both hard and soft strategic targets, and improved the flexibility and survivability of the strategic forces. Three of the top 20 programs—two for tanks and one large program for helicopters—improved the firepower and mobility of Soviet theater forces. 25X1

RDT&E

Unlike our estimates of Soviet investment and operating outlays, which are based on a direct costing of military activities, our estimates of Soviet expenditures for military R&D are made indirectly—using Soviet-published statistics that are highly aggregated and need to be adjusted to include only those activities that the United States would define as RDT&E. Therefore, we are not as confident of these estimates as we are of the estimates of investment and operating expenditures. 25X1

We are confident, however, of the general trends that we observe in Soviet military R&D. The expenditure data, together with observed historical trends in the resources devoted to R&D and weapon program activity, reflect a long-term Soviet commitment since the late 1950s to a vigorous military R&D effort. This commitment, in turn, has produced a program that is large, growing, and of high priority. 25X1

The expenditure data show that since 1960 military R&D expenditures have been the most rapidly growing category of Soviet defense spending. Over the past 20 years, R&D has been consuming an increasing share of the total, accounting for almost one-fourth of all Soviet defense spending in 1980.

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[4] We define a major procurement program as one that requires cumulative expenditures of 1 billion rubles or more.

Table 1

The Top 20 Soviet Weapon System Procurement Programs [a]

1951-65			1965-79		
Rank	Program	Type of Weapon System	Rank	Program	Type of Weapon System
1	Badger	Bomber	1	Flogger	Fighter-interceptor/fighter-bomber
2	Fresco	Fighter-interceptor	2	D-class SSBN	Nuclear-powered ballistic missile submarine
3	Beagle	Tactical bomber	3	Y-class SSBN	Nuclear-powered ballistic missile submarine
4	Fishbed	Fighter-interceptor	4	Hip-Haze	Helicopter
5	Bear	Bomber	5	Foxbat	Interceptor/reconnaissance aircraft
6	Bison	Bomber	6	Fencer	Tactical bomber
7	Fagot	Fighter-interceptor	7	SS-11	ICBM
8	Fitter	Fighter-bomber	8	Backfire	Bomber
9	Fishpot	Fighter-interceptor	9	Fitter	Fighter-bomber
10	Farmer	Fighter-interceptor	10	SS-18	ICBM
11	E-class	Cruise missile submarine	11	Fishbed	Fighter-bomber
12	Cub	Transport	12	Flagon	Interceptor
13	SA-2	SAM	13	Candid	Transport aircraft
14	W-class	Torpedo attack submarine	14	V-class SSN	Nuclear-powered attack submarine
15	Brewer	Bomber	15	SS-19	ICBM
16	Bull	Bomber	16	T-62	Tank
17	Blinder	Bomber	17	SS-20	IRBM
18	SS-4	MRBM	18	SA-5	SAM
19	Flashlight	Interceptor	19	SS-9	ICBM
20	SS-7 SA-1	ICBM SAM	20	T-72	Tank

[a] RDT&E costs and military and NASA-type space system costs are not included in this table.

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Examination of the observable inputs to military R&D—such as manpower, floorspace, and capital expenditures—portrays a Soviet commitment of resources to R&D that is consistent with the expenditure data:

- Analysis of statistical information published by the Soviets provides evidence of long-term growth in the number of people working on military R&D. This is consistent with our estimates of defense R&D employment, which indicate that about half of all R&D personnel are working on military projects. Our estimates also show that the military R&D work force grew at an average annual rate of about 6.5 percent during the 1960s and 4 percent during the 1970s.

- The number of facilities engaged in military R&D has also grown steadily since 1960, a reflection of the increasing complexity of Soviet weapons.

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- Annual construction and capital investment expenditures at Soviet military R&D facilities were high during the early and mid-1960s, when the Soviets were expanding their military R&D base. They declined through the late 1960s and began to rise again in the early 1970s, approaching by 1978 the annual outlays of the early 1960s.

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The level of output of the Soviet defense industrial R&D establishment—measured by the number of systems developed—has remained fairly stable over the last 20 years. The total number of weapons reaching initial operational capability (IOC)—almost all systems that entered the test phase reached IOC—during 1961-80 reflects a sustained high level of military R&D. The output of the R&D establishment was slightly higher in the late 1960s. Apparently, there was a modest decrease in the number of procurement programs during the 1970s. With the greater complexity and improved performance characteristics of succeeding generations of Soviet weaponry, ever-increasing resource allocations have been necessary to maintain this level of output.

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Trends in Expenditures by Military Service [5]

The Soviet armed forces are organized into five major service groups—Air Forces, Ground Forces, Navy, National Air Defense Forces, and Strategic Rocket Forces (SRF). Using the direct costing approach, we can form a reasonable picture of the allocation of most defense spending among these services and gain insights into trends in Soviet priorities for allocating defense resources among competing claimants.[6]

Changes in the distribution of investment and operating expenditures among the services were most dynamic during 1955-65 as a result of policies instituted under Khrushchev (see figure 8). These included substantial manpower reductions in the late 1950s, a shift away from intercontinental bombers, and cutbacks in tactical aviation that impacted on the Air Forces. Moreover, in 1959 a new branch of service was created—the Strategic Rocket Forces (SRF)—which in its formative years drew personnel primarily from the artillery troops of the Ground Forces. The period since 1965 has witnessed more stability in service shares overall, probably reflecting a more settled military doctrine and the more balanced approach to force development of the Brezhnev era. However, a major shift of resources toward the Air Forces did occur during the early 1970s.

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The Navy

The Navy's share of investment and operating funds over the last 30 years has been remarkably stable at about 21 percent. The stability in the naval share is probably a function of the Navy's scope of responsibility, which has been broad enough over the years to include both strategic and general purpose missions. Beginning with the naval programs emphasized largely under Khrushchev, the Soviet Navy evolved from a force oriented to the defense of the Soviet maritime frontiers to a Navy also structured for warfighting on the high seas and for use as an instrument in support of foreign policy in peacetime.

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During the period between the late 1950s and mid-1960s, the Navy's strategic mission was secured, and naval programs focused largely on the application of the new cruise and ballistic missile technology to submarine and surface combatants. A number of large surface combatant programs were canceled to allow the Soviet shipbuilding industry to concentrate its resources on submarine forces and to release resources to civilian shipbuilding.

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Beginning in 1964, Admiral Gorshkov's emphasis on distant operations coincided with a broadening of the scope of the Navy's operations militarily and politically. Accordingly, in the mid-1960s, the share of military shipbuilding expenditures allocated to the procurement of large surface combatants increased.

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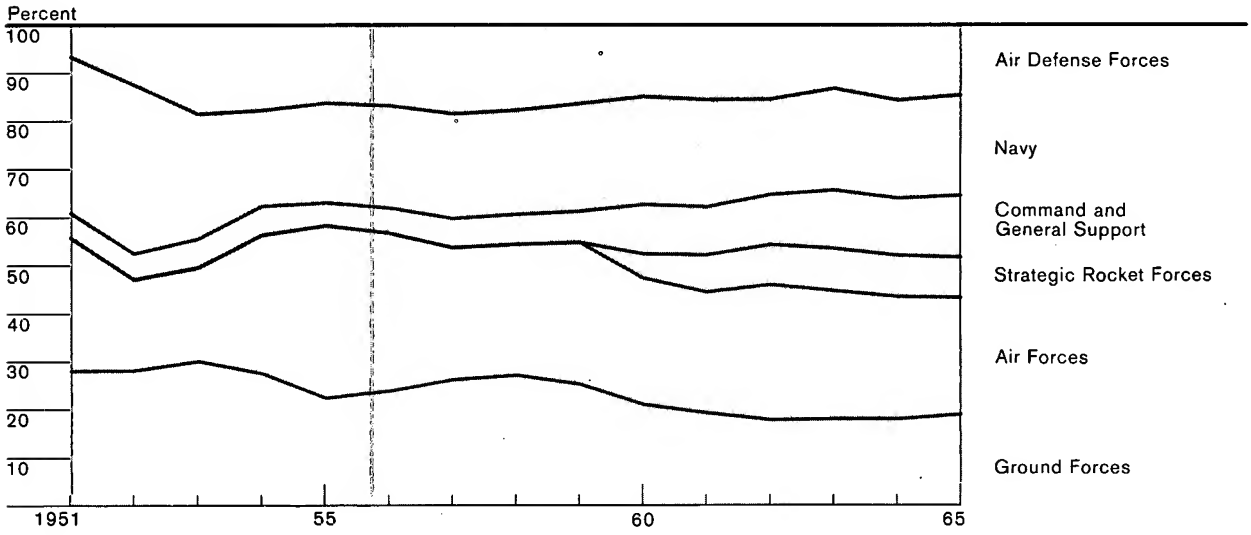
[5] This analysis reflects our understanding of the Soviet armed forces organization as of 1980, prior to the reorganization that has affected components of the Air and Air Defense Forces. It excludes the costs of the type of space programs that in the United States would be funded by NASA.

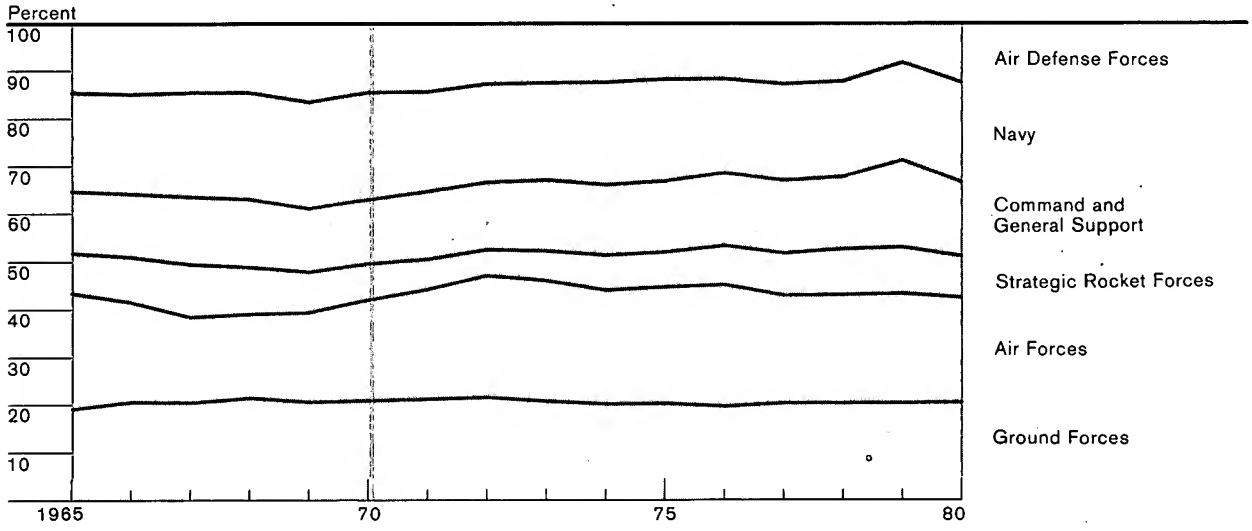
[6] The spending that we cannot confidently allocate in this way includes the costs of RDT&E and of certain national command functions and rear service and other support functions. Therefore, the analysis that follows will include the investment and operating expenditures of the services but exclude their expenditures for RDT&E, and it will treat the national command and support functions as a category separate from the various services.

Figure 8

Military Service Shares of Defense Spending, 1951-65



Military Service Shares of Defense Spending, 1965-80



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These newer ships were generally larger, more capable, and more costly than their predecessors, and improved the Soviet Navy's capabilities for operations in distant areas. Naval procurement of a large SSBN force also began in the late 1960s. 25X1

The SRF

Since its creation in 1959, the SRF share of investment and operating expenditures has fluctuated from 5 to 11 percent. This fluctuation has resulted from the cyclical character of ICBM procurement programs. SRF expenditures peaked in 1967 with the deployment of third-generation SS-11 and SS-9 ICBMs and decreased through 1972 as that deployment was completed. Expenditures then increased throughout the remainder of the decade, reflecting the addition of fourth-generation SS-17, SS-18, and SS-19 ICBMs as well as the SS-20 IRBM to the force. 25X1

The Ground Forces

During Khrushchev's tenure, the Ground Forces' share declined from a high of about 30 percent in 1953 to a low of 18 percent during the early 1960s as Soviet manpower was reduced by more than 2 million men and conventional capabilities were deemphasized. The share began to rise again during the late 1960s with a reemphasis on capabilities for conventional war and the buildup along the Sino-Soviet border. The Ground Forces' share reached a high of 22 percent in 1972 and averaged slightly over 20 percent during the 1970s. 25X1

The Air Forces

The Soviet Air Forces' three components are tactical aviation, strategic aviation, and military transport aviation. Tactical aviation performs counterair, ground attack, reconnaissance, electronic warfare, and helicopter ground attack and troop lift missions. The primary missions of strategic aviation are intercontinental nuclear strikes and conventional or nuclear strikes in support of theater forces. Military transport aviation is responsible for carrying airborne assault forces. 25X1

The Air Forces' share of total investment and operating expenditures has fluctuated widely. It averaged 25 to 30 percent during the 1950s, when tactical aviation and bomber aircraft dominated procurement outlays; declined during the 1960s to a low of 18 percent; and increased again to a high of 26 percent in 1972 and 1976, as a result of the reemphasis by the Soviets on conventional capabilities and the resultant modernization and reequipment of their tactical air forces. 25X1

National Air Defense Forces

The fortunes of the National Air Defense Forces declined somewhat during the 1970s as compared with the previous two decades. During the 1950s and 1960s, the air defense share of investment and operating funds averaged about 15 percent, reflecting the large-scale deployments of interceptor aircraft in the 1950s and the costly ABM and SAM deployments of the 1960s. Soviet expenditures for strategic defense fluctuated during the 1970s, and the share dropped to about 12 percent, reflecting at least in part the constraints of the ABM Treaty on costly ABM deployments. Procurement of new third-generation fighter aircraft was an important influence on spending in the 1970s. 25X1

A major spending increase for air defense forces began in 1980, and we estimate that it will last through the mid-1980s as the Soviets improve their defenses against low-altitude bomber and cruise missile attacks. 25X1

The Soviets have undertaken a large-scale reorganization of their air defense forces that will significantly affect the command, support, and operational functions of those forces. The full effects of the reorganization are unknown, but it should streamline command and control procedures, reduce redundancies in structure and support, and permit greater efficiencies in operation. We cannot determine at this time how funding for national air defense programs will be handled or how much savings might result from the reorganization. We expect, however, that there will be some savings in procurement, logistics, and personnel. 25X1

Command and General Support

Cumulative expenditures for command and general support activities [7] from 1965 through 1980 were

[7] This category includes costs associated with rear services, salaries of Ministry of Defense employees, space programs that in the United States would be managed by the Department of Defense, border guards, and material for nuclear weapons. 25X1

nearly triple what they had been for the previous 15-year period. The share of total investment and operating costs for these activities rose to 10 percent in 1960 and have been rising steadily during the past 20 years to their present share of about one-sixth. 25X1

The increase in support costs since 1965 reflects an increase in the size of the Soviet armed forces and the central Ministry of Defense apparatus, the increased complexity in controlling and supporting increasingly advanced weapon systems, and the substantial growth of the Soviet military space effort. 25X1

Factors Shaping Defense Spending

Over the past 30 years the level, growth rate, and structure of Soviet defense spending have resulted from the military programs and forces the Soviets have acquired. These, in turn, have been shaped by the interaction of a number of factors, including new weapon technologies, political successions, reaction to Western military developments, and the evolution of Soviet military doctrine. This section will trace, in broad outline, the evolution of Soviet military forces over the past three decades and highlight some of the more important factors that influenced that evolution.

The Fifties

Overview

The 1950s represented a decade of transition for the Soviet Union. In the political sphere, the death of Stalin in 1953 led to the relaxation of terror and initiated a series of political events that culminated in Khrushchev's rise to power. In the military sphere, theoreticians began considering the implications of nuclear weapons and emerging new technologies for the conduct of war and force structure. As a result, fundamental changes were made in the armament, organization, and operational concepts of the Soviet armed forces. By the end of the decade, the forces had evolved from the extremely large, conventionally armed, continental army of the early 1950s to a smaller force that was being equipped with missiles for the nuclear battlefield. It was in the context of these developments that Soviet defense spending declined during the late 1950s.

The Early Fifties

Stalin's Legacy. Soviet force developments from 1951 through 1955 were governed largely by defense priorities and weapon programs established by Stalin during the late 1940s and early 1950s. These included:

- *Priority development of nuclear weapons and missile technology.* In the postwar reconstruction period, Stalin was prepared to give nuclear weapon and missile development programs the necessary construction materials, transportation facilities, machine tools, and laboratory equipment. All of these resources were in extremely short supply. In the late 1940s, the test facility at Kapustin Yar was established, and the first three missile and space general design bureaus were put into operation. The most prominent one—S. P. Korelev's—was responsible for ballistic missiles. Early products of this design bureau included the Scud short-range ballistic missile (SRBM), the SS-3 medium-range ballistic missile (MRBM), and the SS-6 ICBM (also used as a space booster). 25X1

- *The rapid buildup of an air defense force.* Early in the post–World War II period, the Soviets evidently considered the major threat to be the "thousand-plane raid," similar to those conducted against Germany. As a result, they developed and deployed great numbers of high-altitude interceptors, radar-controlled antiaircraft artillery guns, and, later, surface-to-air missiles (SAMs) to defend against US strategic bombers. By the mid-1950s, air defense interceptor strength reached a level of about 7,000 aircraft (mostly MIG-15s and MIG-17s), and the first SAM (SA-1) was being deployed.

- *High priority on the development and deployment of strategic bombers.* In the late 1940s, Stalin authorized large-scale production of the TU-4 (Bull), Andrei Tupolev's copy of the US B-29. In 1949 Stalin also apparently ordered the development of a jet bomber capable of reaching the United States. 25X1

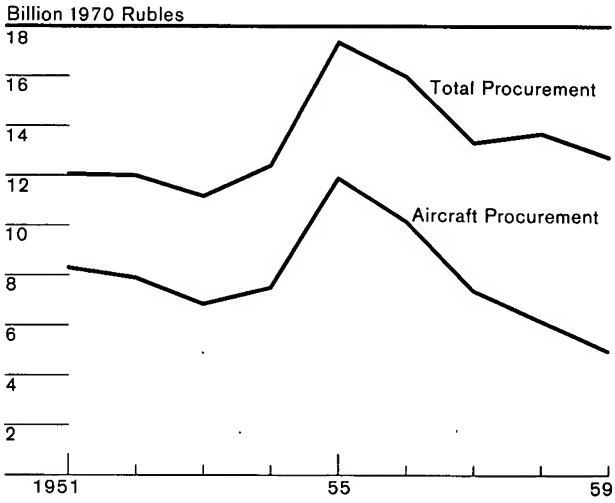
- *A long-term naval construction program.* By 1950 the naval leadership gained Stalin's approval for a 10-year construction plan providing for the expansion of the surface fleet, including aircraft carriers and several classes of gun-armed cruisers and destroyers. The Soviets also planned for an attack submarine force of as many as 1,000 units to interdict sea lines of communication and to assist in coastal defense. 25X1

Military Force Procurement. In the early 1950s the Soviet armed forces were manpower intensive, dominated by large artillery formations and tactical air forces organized for the type of land campaigns experienced during World War II. From 1951 through 1955, the Ground Forces, which stood at about 2.5 million men in 1955, comprised over half the total Soviet military manpower and received the largest share of defense expenditures—averaging just under 30 percent

Figure 9 shows that procurement in the early 1950s was driven by aircraft production, which from 1951 through 1955 amounted to about two-thirds of total Soviet procurement outlays. During this period, the Soviets assigned most available production capacity to light bombers and fighters designed either for support of theater ground forces or for homeland air defense. In 1952 the Soviets sought to shore up their air defense network, and the production of fighter aircraft increased markedly. More than 3,000 MIG-15s were produced in that year, and the MIG-17 Fresco program began. In 1953 the Soviets were phasing the MIG-15 out of their forces and began introducing the MIG-17, also in large numbers.

Figure 9

Soviet Aircraft Procurement, 1951-59



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The Revolution in Military Affairs (1953-60)

A Turning Point. The death of Stalin in March 1953 produced a turning point in the development of Soviet military forces and marked the beginning of what the Soviets termed the "revolution in military affairs."

Prior to Stalin's death, a heavy censorship was imposed on the military's discussion of nuclear weapons and their implications for general war. Stalin's "permanently operating factors" [8] were the guideposts to military planning for a future war. His death allowed the military to devote serious attention to the potentialities of nuclear weapons, their impact on the nature of war, and the changes necessary to their force structure and organization to meet the requirements of the nuclear battlefield. During 1953-60, the Soviet military was in transition. The roles and missions of the military services had to be sorted out in response to the development of strategic weapons, a new military service—the Strategic Rocket Forces—was created, and the organization of the Ground Forces was substantially changed, resulting in a significant reduction in military manpower. It was in the context of this transition that overall Soviet defense spending declined in the late 1950s.

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A second consequence of Stalin's death was the political ascendancy of Nikita Khrushchev. While in office, he promoted a reorientation of Soviet defense policy toward strategic missiles, and after 1960 he pursued policies directed toward downplaying the importance of intercontinental bombers, large standing armies, and conventional air and naval forces.

25X1

[8] In the special social context of warfare, what were known as the "permanently operating factors" would determine the outcome. These factors were "the stability of the rear, the morale of the army, the quantity and quality of divisions, the armament of the army, and the organizational ability of the army commanders." New doctrinal issues raised by the development of nuclear weapons, such as the possible decisiveness of a nuclear strike, could not be discussed within the rigid Stalinist framework

These policies embroiled him in disputes with the professional military until his removal in October 1964.

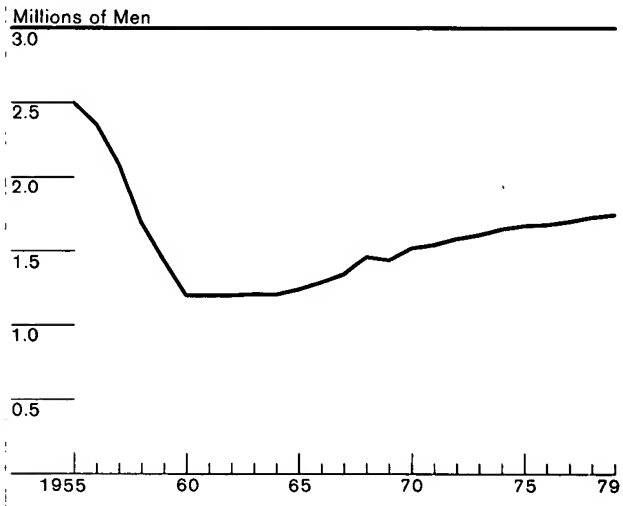
Shifting Military Priorities. In 1954 a series of tests of nuclear weapons and their effects on troops began, together with the development of doctrines for the employment of new units and weapons. There followed a redirection in military programs that involved a shift of emphasis away from conventional forces and weapons and increasingly toward the incorporation of the newly developed missile technology into all services:

- *Substantial cuts were made in active military manpower.* The strength of the Ground Forces was reduced by 1.3 million men, and by 1960 it stood at half its 1955 strength (see figure 10). Much of this reduction in strength resulted from changes to the organization of the Ground Forces, which had cut manpower in Soviet divisions by about one-third.

- *Soviet theater forces were streamlined for nuclear war.* From the mid-1950s to about 1960, Soviet military planners and theoreticians were occupied with the problem of reconciling traditional ground offensive tactical concepts with the new nuclear arms environment. Line divisions and field armies were developed that were lean in logistical support but heavy in their reliance on the tank as the primary ground combat weapon on the nuclear battlefield. Mobile tactical missile systems with ranges of 10 to 50 km were introduced into the Ground Forces. Because the Soviets thought that such nuclear weapons would be able to replace the massed artillery and tactical air formations of World War II in achieving breakthroughs, conventional field artillery and tactical air forces were greatly reduced. This streamlining, in turn, resulted in a significant reduction in the conventional warfighting capabilities of these forces.

- *Stalin's ambitious naval construction program was scrapped.* Instead of the oceangoing navy envisioned by Stalin, the new Commander in Chief of the Navy, Admiral Gorshkov, was ordered to build a fleet of missile-armed submarines and surface combatants to defend the seaward approaches to the USSR, particularly from Western aircraft carriers.

Figure 10
Estimated Soviet Ground Forces Military Manpower, 1955-79 25X1



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By 1957, most of the ways at Soviet shipyards previously set aside for constructing large surface combatants had been converted for the construction of ships for the merchant fleet.

- *Resources were shifted from the heavy bomber to the ballistic missile as the means of intercontinental attack.* There is some evidence that the Soviets initially planned to deploy both the Bison and the Bear in large numbers. However, several factors combined to limit their deployment: technical problems with the aircraft (in his memoirs, Khrushchev cited the poor cruising speed and altitude of the Bear and the inadequate range of the Bison); a strengthening of US air defenses; and, most important, the first successful test of the SS-6 ICBM in 1957.

- *Priority was given to a substantial deployment of medium-range strategic ballistic missiles that could cover targets in Europe and around the periphery of the USSR.* These MRBM systems, which were already being deployed on a small scale, were to augment the growing force of medium bombers already equipped for nuclear delivery operations in the same areas. SS-4 deployment began in 1958 and by mid-1962 reached a level of 500 to 600 MRBM launchers.

Central to the Soviet decision to pursue a "peripheral strategy" in the late 1950s was the availability of MRBMs and IRBMs for large-scale deployment. Other factors probably included the conclusion of arrangements in December 1957 for incorporating American-owned and -controlled tactical nuclear armaments in the NATO arsenal and the rapid expansion of the US strategic bomber forces and their overseas base network.

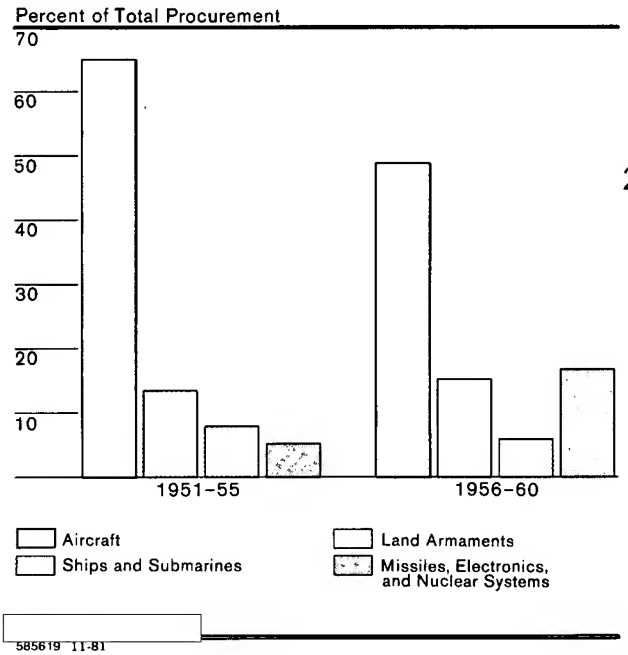
Strategic Weapons and Organizational Issues. The development and initial deployment of strategic missiles during the late 1950s generated heated debate and conflict among the military services over the relative significance of the new weapons and the proper organizational context for their application. The artillery troops of the Ground Forces, the Air Forces, and the Navy all staked out claims to participate in the missions and development programs using the new technology. Most of the early strategic missiles came under the control of either the Air Forces or the artillery troops of the Ground Forces. In 1959, however, the controversy culminated in the formation of an entirely new military service of the Soviet armed forces—the Strategic Rocket Forces (SRF)—which was to have control of all ballistic missiles with a range greater than 1,000 kilometers.

Trends in Defense Spending. These redirections in programs and forces had an impact on Soviet defense expenditures during 1956-59. Soviet military outlays were reduced by an average of almost 4 percent a year.

In resource terms, the only categories of Soviet defense spending that increased during the late 1950s were construction and RDT&E. The increasing trend in RDT&E expenditures was consistent with the continued expansion of the Soviet missile and space-related general design bureaus, indicating an increasing commitment of resources to the development of advanced weapons.

Figure 11

Procurement Share of Weapon Systems



During the 1950s, the structure of weapon procurement shifted from predominantly conventional armament to advanced weapons (see figure 11):

- In 1955 Soviet procurement was dominated by the substitution of larger, more expensive strategic bombers for earlier models. Series production was beginning for the Bison and Bear heavy bombers, and production for the Badger medium bomber was increasing.
- By the late 1950s, aircraft's share of military procurement dropped from 65 to 50 percent, while expenditures for such advanced weapon categories as missiles, electronics, and nuclear weapons more than tripled.

Costs for RDT&E and space were still at a relatively low level in the late 1950s, and the financing for developing and procuring advanced weapons during this period could, therefore, come largely from the reductions in current forces. Personnel expenditures were 25 percent below what they had been during the early and mid-1950s, and aircraft procurement dropped substantially. Many Soviet aircraft plants at this time were being reequipped to produce missiles.

25X1

The Sixties

Overview

Whereas the 1950s was a decade in which Soviet military doctrine and forces adjusted to the changed requirements of the nuclear systems then being developed, the 1960s was a decade in which nuclear delivery systems began to enter the forces in significant numbers. By the beginning of 1962, decisions were taken on the major ICBM programs that contributed to the buildup of the mid- and late 1960s. Additionally, by 1965 there was a renewed appreciation for forces capable of waging a conventional war, which resulted in an expansion and modernization of the Ground Forces and the Navy during the late 1960s.

25X1

The Early Sixties

The declining trend in Soviet defense expenditures during the late 1950s was sharply reversed in 1960, when a steady upward growth trend began. This growth was particularly rapid between 1960 and 1965, averaging about 8 percent annually—about 3 percentage points higher than growth in the economy. The space program, strategic weapons, and military RDT&E contributed to the rapid growth in the early 1960s, whick took place within the context of a policy controversy between Khrushchev and the professional military.

25X1

Policy Controversy. Beginning in 1960, Khrushchev attempted to change the prevailing military view on nuclear war. From the mid-1950s to about 1960, as previously noted, the Soviet military attempted to reconcile traditional concepts of a sweeping European ground force offensive with the new environment created by nuclear arms. Nuclear weapons were seen primarily as a substitute for concentrated artillery and aerial bombardment. Combat might be nuclear from the outset, it was reasoned, but the decisive role would still be played by massed armies that would destroy opposing forces and occupy enemy territory.

25X1

By 1960, technical developments in the ballistic missile field laid the basic foundations for a Soviet intercontinental strategic capability. Given this capability, Khrushchev came to believe that war between the United States and the Soviet Union would result in an intercontinental nuclear exchange and the devastation of Western Europe. The war's outcome would be determined by massive US-Soviet nuclear exchanges during the first hours. Strategic exchanges also would decide any European conflict. Therefore, he tended to favor the allocation of considerable resources to the development of those systems that would be utilized in the initial exchange—for example, missiles—while opposing expenditures for the maintenance of large land armies, tactical and bomber aviation, and the surface fleet.

25X1

In a speech before the Supreme Soviet in January 1960, Khrushchev set the guidelines to be used in developing a new and comprehensive military strategy. This new strategy departed radically from the traditional Soviet emphasis on maintaining large conventional forces and emphasized instead the principle of nuclear deterrence. He stressed that the USSR, with its rocket-nuclear forces, had sufficient means to destroy totally any enemy and argued that firepower, not manpower, now determined the military power of a state.

25X1

Accordingly, Khrushchev indicated that the Air Force and the Navy had lost their importance, that the production of bombers and other such obsolete equipment would be cut sharply, and that the Soviet armed forces would be cut by roughly one-third, from around 3.6 million to 2.4 million men. Such a reduction, he went on to say, meant no loss of combat capability, since the firepower provided by the new weaponry

would make up for the manpower cut. Khrushchev's speech clearly indicated his belief that missile programs should be a way of reducing resources used by the military, not increasing them.

Khrushchev's motivations for pursuing further manpower reductions and savings on conventional forces may have involved demographic considerations. Owing to the low birth rates during World War II, the number of draft-age males available annually for military callup began to decline in the late 1950s, reaching a low of 900,000 men in 1961—as compared with about 2 million men annually during the early 1950s. In the face of declining growth in manpower, the Soviet Union launched in 1959 the ambitious Seven-Year Plan, which required more additions to the civilian labor force than could be supplied through population growth. Thus, the military reductions may have been intended, in part, to relieve a potential manpower shortage. 25X1

There is also the possibility that Khrushchev envisioned using the funds released by his intended manpower reductions to provide for such advanced weapons as ICBMs and SAMs, which the Soviets would be deploying in large numbers during the 1960s.

Under pressure from Khrushchev, the Soviet military modified its approach to a theater campaign in Europe. The military came to acknowledge the decisive role of the initial nuclear strike, but Ground Forces advocates within the military continued to adhere to traditional views on a subsequent campaign. Even if war were nuclear and characterized by missile and air strikes from the USSR, they argued, a large-scale ground offensive with armored forces would be required to exploit the gaps in NATO's defenses created by nuclear attacks, to destroy NATO's military forces, and to occupy Western Europe.

This military resistance to Khrushchev's strategic views, coupled with increasing international tension after the Berlin Crisis of mid-1961, frustrated Khrushchev's attempts to carry out the troop reductions he publicly announced in 1960. Total military manpower increased from 1960 through 1965, and the Ground Forces were not cut (see table 2). The failure of the troop reduction scheme, in turn, denied to the economy the extra manpower needed for the Seven-Year Plan and the savings with which the leadership may have intended to offset the high costs of the space program and the increasing deployment of strategic weapons. 25X1

Table 2 Millions of Men

Soviet Military Manpower, 1960-65 25X1

	1960	1961	1962	1963	1964	1965
Total active military manpower	3.4	3.3	3.5	3.6	3.7	3.8
Ground Forces	1.2	1.2	1.2	1.2	1.2	1.2

25X1

Space. Early Soviet space efforts paid major dividends in national prestige, beginning in 1957 with the launching of Sputnik I. During the late 1950s, the Soviet space program achieved most of its goals at a relatively low cost through the modification of launch vehicles originally developed for use as ballistic missiles. 25X1 25X1

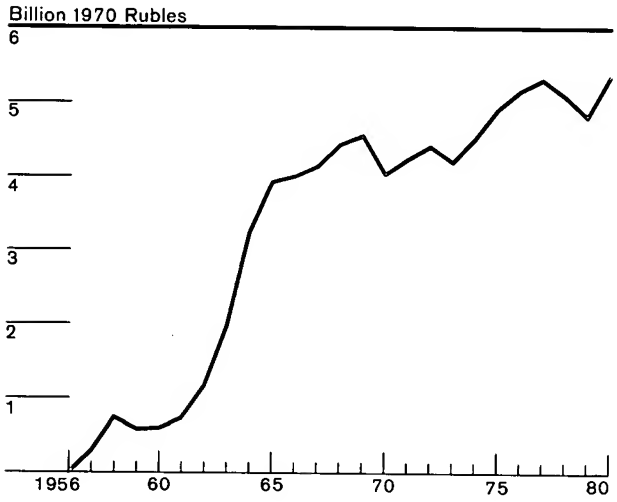
During the late 1950s, however, the Soviets substantially increased the level of effort devoted to space system design and development (see figure 12). Accordingly, after 1962, the Soviet space program became a major claimant of Soviet defense resources. Payloads became heavier, and development of larger boosters designed specifically for space applications became necessary. Coupled with manned space flight activity, this drove expenditures up rapidly until the mid-1960s. 25X1 25X1

RDT&E. Military R&D expenditures grew very rapidly during the early 1960s and were heavily weighted toward aircraft, missiles, and space systems. During 1960-65, the RDT&E share of total defense spending increased from 9 to 14 percent.

25X1

Figure 12

Soviet Expenditures for Space, 1956–80



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This rapid growth is consistent with evidence on activities in the Soviet R&D establishment during the same period. This evidence points to a pattern of major expansion within the defense industries during the early 1960s:

- During 1960-65, employment in the technical sciences grew at an average annual rate in excess of 18 percent. Nearly all military and military-related technology falls under subbranches of the technical sciences.

25X1

We estimate that annual construction and capital investment expenditures that supported this expansion peaked before 1964.

Strategic Weapons. During the early 1960s the Soviets accorded high priority to their strategic programs, particularly the newly created SRF, and deemphasized conventional weapons production correspondingly. They apparently decided on the SS-11 as the ICBM they would deploy in large numbers. The two earlier generations of ICBMs—the SS-6 as well as the SS-7 and SS-8 systems—were not considered suitable for large-scale deployment. The massive installations, large support requirements, and clumsy handling procedures rendered the SS-6 undesirable for extensive deployment of operational ICBM launchers. The deployment and operational requirements for the SS-7 and SS-8 ICBMs (first deployed in 1960 and 1962, respectively) were improvements over those for the SS-6 and were derived from the experience the SRF had with MR/IRBM systems. Their deployment modes from 1960 through 1961 evolved from soft sites to hard-site configurations. The SS-11 apparently possessed the combination of technical and operational characteristics the Soviets considered suitable for large-scale deployment.

25X1

In addition to their ICBM program, the Soviets committed considerable resources to MRBM and IRBM deployments as well as to the development of ballistic missile defenses. During 1958-65, they fielded some 675 SS-4 and SS-5 launchers, most of which were deployed in the western USSR. Moreover, by the early 1960s, the major effort that the Soviets began in the early 1950s to develop ballistic missile defenses became evident to the Intelligence Community. Not only were the Soviets working on a large-scale development program, but they had already committed themselves to deployment. An intense R&D program was in progress at the Sary Shagan missile test center, construction of the Moscow ABM system was under way, and Hen House radars were being built in forward areas to provide early warning of ballistic missile attacks.

25X1

The Middle and Late Sixties

By the mid-1960s a consensus was emerging within the military on the need for an across-the-board expansion and modernization of all military forces.

25X1 25X1

The immediate effect of Khrushchev's ouster in October 1964 was to remove the primary obstacle to larger resource commitments to Soviet general purpose forces and permit the views of the advocates of large combat forces to gain much wider acceptance.

A rationale for improving Soviet conventional forces was provided by NATO's adoption of a "flexible response" strategy, which envisaged a period of nonnuclear war. This obliged Soviet planners to reconsider their tenet that war would begin with a decisive nuclear exchange and to plan for a war that, at least in its initial stages, could involve large-scale conventional operations. 25X1

A further requirement to upgrade and expand Soviet conventional forces came from China. Sino-Soviet relations, which began to decline in the late 1950s, further deteriorated after late 1964. The first Chinese nuclear test in October of that year signified to the Soviets that the Chinese challenge was serious and of a long-term nature. 25X1

In response to these perceived requirements, the Brezhnev political leadership has pursued a broad range of military programs since 1965, demonstrating a long-term commitment to a policy of balanced force development. From the beginning, this leadership has been aware of the economic costs of pursuing such a policy. As early as 1965, Soviet leaders spoke of the burdens imposed on the economy by defense and implied—directly or indirectly—that the expenditures required some sacrifice of other goals. Indeed, the steady growth of Soviet defense expenditures since 1965 reflects the willingness of the present leadership to direct increasingly costly resources toward an expanding military effort. 25X1

The Sino-Soviet Border. A decision probably was made some time prior to mid-1965 to initiate a military buildup along the Sino-Soviet border. From 1965 through the early 1970s, more than 300,000 men, about 25 divisions, almost 1,000 tactical aircraft, and several hundred helicopters were added to the forces along the border.

The cost of this buildup was significant, taking almost one-third of the increment to total investment and operating expenditures between 1965 and 1970.

The heaviest influx of forces to the border area during the five years of the military buildup took place in 1967 and 1968. Formation of about half of the new Ground Force divisions opposite China began during this two-year period, and several divisions that were formed a year or so earlier began to receive major increments of personnel and equipment. Most of the increase in tactical air forces opposite China also took place at this time, with all but two of the new air regiments being in place by the end of 1968. 25X1 25X1

Enhancing Conventional Capabilities. The new Soviet leadership faced another dilemma in addition to the one posed by China. Although Soviet military doctrine came to accept the possibility of a beginning conventional phase in an East-West conflict, Soviet theater forces were structured for a short nuclear war. 25X1

The Ground Forces were tank heavy and had a limited support structure. Much of their conventional firepower (for example, artillery) had fallen casualty to the "nuclear streamlining" of the late 1950s and early 1960s. In the tactical air forces (Frontal Aviation), primary emphasis was placed on battlefield air defense and nuclear strikes. There was no effort to deploy tactical aircraft with extended range or the capability of carrying large conventional payloads. There is clear evidence that Soviet planners recognized in the mid-1960s that their tactical aircraft lacked the range to conduct conventional strikes on most of NATO's airfields and other long-range targets. Moreover, few helicopters were in use, command and control equipment was limited, and logistical elements were geared to the low ammunition consumption levels expected in nuclear war and to the general belief that such a war would be relatively short. 25X1

Through the late 1960s, the Soviets emphasized:

- Expanding equipment inventories of existing types of weapons.
- Making organizational changes within divisions.
- Developing more sophisticated weapons—such as self-propelled artillery—to improve conventional warfare capabilities.

25X1

25X1

- Strengthening the entire logistical system to provide both for greater ammunition and POL stockpiles and for a larger flow of supplies during hostilities.
- Increasing construction activity at Ground Forces installations. 25X1

In about 1966, additional field artillery appeared in Soviet divisions in East Germany and the Soviet Far East. Over the next few years, most of the division-level artillery eliminated during the 1950s was restored. 25X1

To support the increasing manpower and expanding equipment inventories in the Ground Forces, construction activity increased substantially at Ground Forces installations after 1964. Although a large portion of this activity was in connection with the buildup along the Sino-Soviet border, Ground Forces facilities throughout the USSR were being upgraded. 25X1

During this period, the Soviets also planned for a major reequipment program for their tactical air force, and in the mid-1960s developmental work began on new, more capable fighter-bombers. This program was carried out during the early and mid-1970s and resulted in a major shift in resource allocation to the Air Forces, whose share of investment and operating expenditures increased from 18 percent in the late 1960s to 26 percent in 1972 and again in 1976. 25X1

Shifting Naval Priorities. Beginning in the mid-1960s, the Soviet Navy began evolving from a force oriented to the defense of the Soviet maritime frontiers toward a more balanced navy structured also for nuclear war, for open-ocean operations, and for use as an instrument in support of Soviet foreign policy in peacetime. Significant trends included the following:

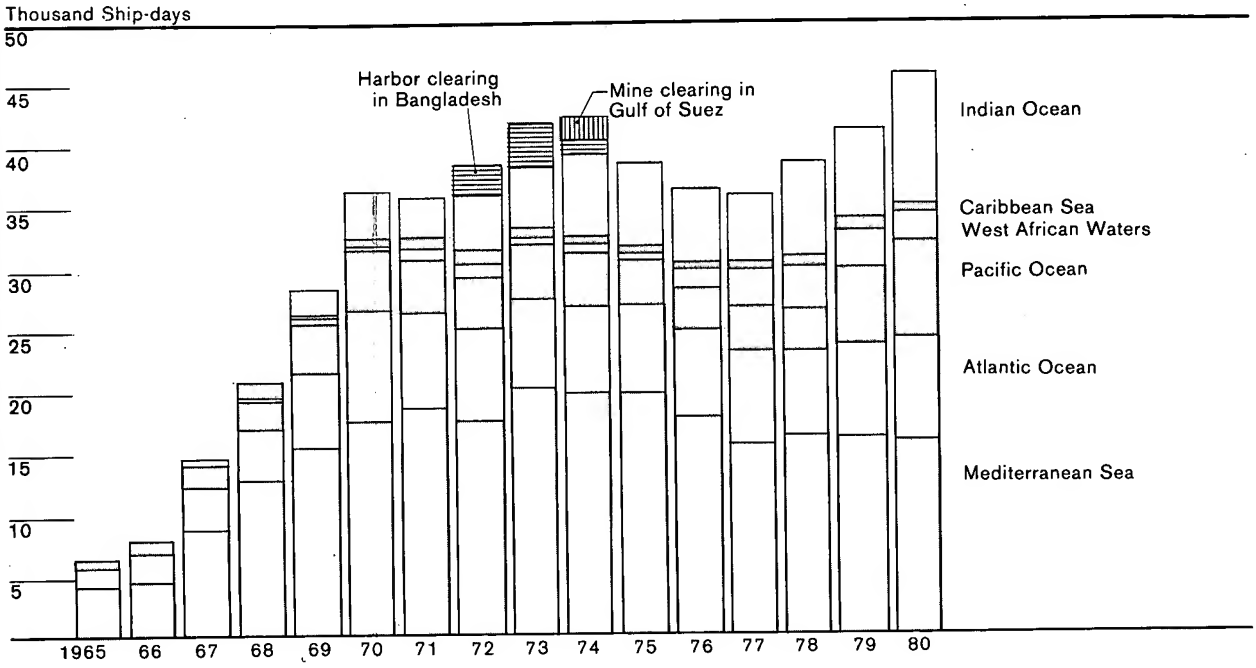
- The emphasis of ship procurement shifted from the cruise missile and attack submarine programs of the late 1950s to ballistic missile submarines (the Y-class SSBN) and large surface combatants (3,000 or more metric tons full-load displacement). The latter included such ship classes as the Kashin guided missile destroyer (DDG), the Kynda guided missile cruiser (CG), the Kresta I CG, and the Moskva guided missile aviation cruiser.
- During the late 1960s, there was a significant increase in Soviet naval activity away from home waters. Much of this activity probably reflected a Soviet decision to use naval forces more extensively in furthering foreign policy objectives in peacetime. From 1965 to 1970 the operations of Soviet general purpose ships in distant waters increased an average of 42 percent a year, as ship operating days rose from roughly 6,000 to over 35,000 (see figure 13). This increase reflected the rapid growth of the Soviet Mediterranean Squadron (particularly after the Arab-Israeli war in 1967), the initiation of operations in the Indian Ocean in 1968, the commencement of periodic deployments to the Caribbean in 1969, the establishment of a patrol in West African waters in 1970, and more extensive exercise activity in the Atlantic and Pacific approaches to the USSR during the five-year period. 25X1

Strategic Forces. During 1965-70, the Soviets deployed the major portion of their third-generation ICBMs, moving forward with decisions that had been made while Khrushchev was still in power.

In 1965 the Soviet ICBM force consisted of 224 operational launchers at 18 complexes. It was composed almost entirely of second-generation systems. The SS-7 was the most numerous and was deployed in soft launchers in relatively concentrated groups. Second-generation ICBM deployment was halted in 1964, and, late that same year, the Soviets began field construction of single silos for two third-generation ICBMs—the SS-9 and SS-11. 25X1 25X1

A dramatic increase in ICBM deployment took place in the late 1960s (see figure 14). The production for that deployment more than tripled during 1965-69 in comparison with the previous five-year period and reached an all-time high in 1967, with the procurement of more than 400 ICBMs. The most widely deployed ICBM was the SS-11. More than 700 of these missiles were deployed in single dispersed silos during the late 1960s. 25X1

Figure 13
Operations of General Purpose Naval Forces Outside Home Waters[a]



[a] Auxiliaries and support ships make up about 50 percent of the above figures. Ballistic missile submarines, hydrographic ships, and space support ships are not included.

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In 1968 the Soviets deployed their first modern nuclear-powered ballistic missile submarine—the Y-class SSBN armed with 16 SS-N-6 SLBMs. The Y-class design used available technology, and with this new-generation ballistic missile submarine the Soviets began a rapid expansion of their SLBM force. By 1969 Soviet shipyards were delivering Y-class SSBNs at a rate of six units per year

By the end of the 1960s, the Soviet Union approached an overall strategic equality with the United States, equaling it in the number of land-based ICBMs deployed and rapidly building an SSBN/SLBM force that would soon be comparable in size to the US Polaris force.

Soviet expenditures for the National Air Defense Forces also rose in the late 1960s, peaking in 1969 at a level 50 percent higher than that of 1965. This reflected primarily the rapid and costly deployment of the Moscow ABM system and the procurement of the SA-5 SAM.

25X1

Space. In the mid-1960s, as earlier development programs reached completion, the Soviets began to launch newer series of satellites with practical military and economic applications. Those directed toward meteorology and civil communications were heavily publicized to enhance the image of the Soviet Union's technical and scientific strength.

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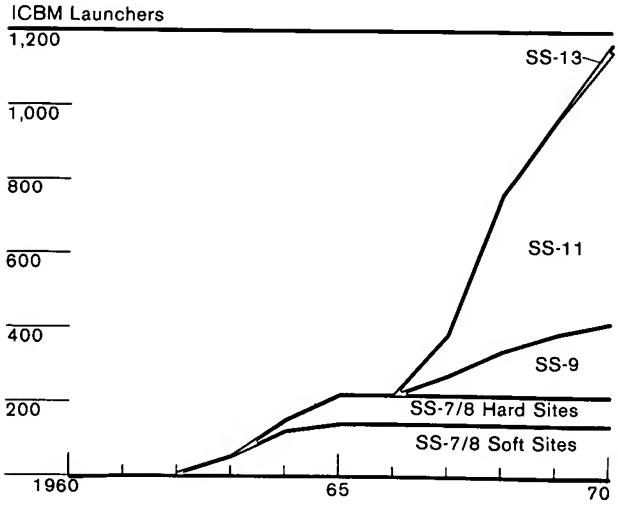
Figure 14

Soviet ICBM Deployment, 1960–70



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In the late 1960s the Soviets began to test larger and more complex space boosters and spacecraft. They encountered serious setbacks in these programs and did not move forward as they expected to. Their failure to successfully develop the large booster necessary for manned lunar missions, coupled with the US success in the Apollo Project, forced the Soviets to emphasize in the 1970s their successful Earth-orbiting space stations. At the same time, they reduced development of space programs related to the big boosters and began another round of big-booster development scheduled to reach fruition in the mid-1980s.

The Seventies

Overview

During the 1970s the Soviets continued their pursuit of military power, concentrating on qualitative improvements that reversed perceived imbalances within their strategic and theater forces. Significantly, the evolution of Soviet doctrine, which had turned Soviet attention toward increasing conventional force capabilities in the late 1960s, led to more flexible theater nuclear forces and options after 1970. By the end of the decade, the Soviets had enhanced their capabilities to engage the West across a broad spectrum of conventional and nuclear conflict. Moreover, these developments occurred against the backdrop of a more active and direct use of Soviet military power in the Third World.

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Developments in the Forces

Strategic Forces. During the early and mid-1970s the Soviets completed the deployment of their third-generation ICBMs, with some 1,300 in the field, and rapidly expanded their SLBM forces. By 1975 they had half again as many ICBM launchers as the United States and had matched it in numbers of SLBM launchers

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That same year, with the deployment of a fourth generation of ICBMs—the SS-17, SS-18, and SS-19—the Soviets began closing the gap in deliverable weapons through MIRVing (see figure 15) and improved the accuracy of their ICBMs by a factor of three. By the end of the decade, it was apparent that more than 800 of these ICBMs would be deployed. Trends in the number and capabilities of Soviet ICBM RVs indicated that the Soviet ICBM force would be capable of destroying most US ICBM silos and still have many warheads remaining for other purposes.

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In terms of cumulative investment costs, the outlays for the fourth-generation ICBM systems were about equivalent to the outlays for the third-generation ICBM deployments of the late 1960s and early 1970s.

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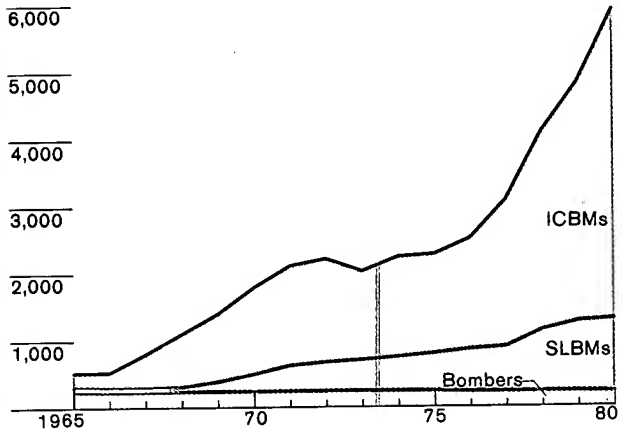
Figure 15
Composition of Soviet Weapons for Intercontinental Attack, 1965–80



During the 1970s the distribution of construction activity at defense plants devoted to the production of strategic weapons provided indications of trends that strategic programs would follow during the early 1980s. According to these indicators, it appeared that greater resources would be devoted to the production of solid-propellant offensive ballistic missiles; production of SLBMs probably would begin to increase in 1981; and the relative importance of strategic bomber production would begin to increase by 1982.

SALT and the Economics of Arms Control Agreements. During the 1970s the Soviets entered into strategic arms limitation agreements with the United States. Although Soviet participation in SALT probably has been motivated by a combination of strategic, political, and economic concerns, it appears that the economic factor has been least significant.

Soviet spending for all strategic forces—offensive and defensive—constitutes a relatively small share of total military expenditures (about one-fifth). Consequently, increases in outlays for strategic forces tend to have a muted impact on overall growth in defense spending. 25X1

Even if Soviet expenditures on strategic forces were a larger share of overall spending, the economic benefits derived from limitations on strategic arms would probably be small, at least in the near term. Production resources at plants that manufacture strategic weapons such as aircraft and missiles are highly specialized and not readily transferable to civilian uses. 25X1

Theater Nuclear Systems. During the 1970s Soviet theater nuclear forces, especially those deployed forward in Central Europe, experienced important changes in both size and capability. These changes included:

- Significant increases in the inventory of tactical nuclear delivery systems in Central Europe. Since 1970, tactical surface-to-surface missile launchers have increased by one-third, and nuclear delivery aircraft have tripled (see figure 16). 25X1
- A new generation of tactical ballistic missile systems with better ranges, accuracy, and mobility than their predecessors.

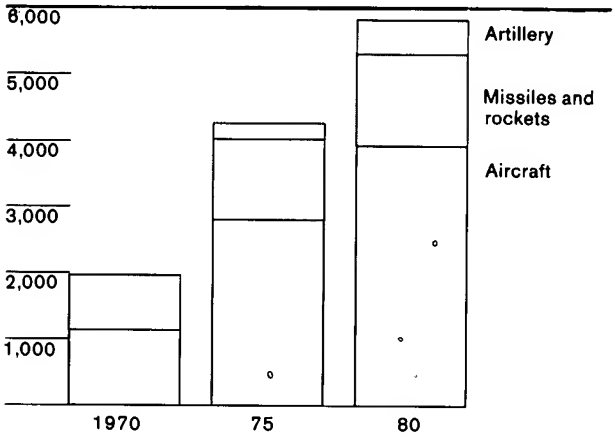
Moreover, modernization of Soviet long-range theater nuclear forces began with the deployment of the Backfire bomber in 1974 and the MIRVed SS-20 IRBM in 1977. 25X1

These force improvements increased the flexibility with which the Soviets could employ their theater nuclear forces and provided them with a capability for conducting theater nuclear war at high levels of intensity before having to resort to the peripheral strike forces based on Soviet territory. 25X1 25X1

Frontal Aviation. Perhaps the most significant development in Soviet forces during the 1970s was the modernization program carried out within Frontal Aviation. This program transformed the Soviet tactical air force into a balanced force capable of performing a variety of the basic military tasks required for 25X1

Figure 16

Tactical Nuclear Delivery Systems, 1970-80



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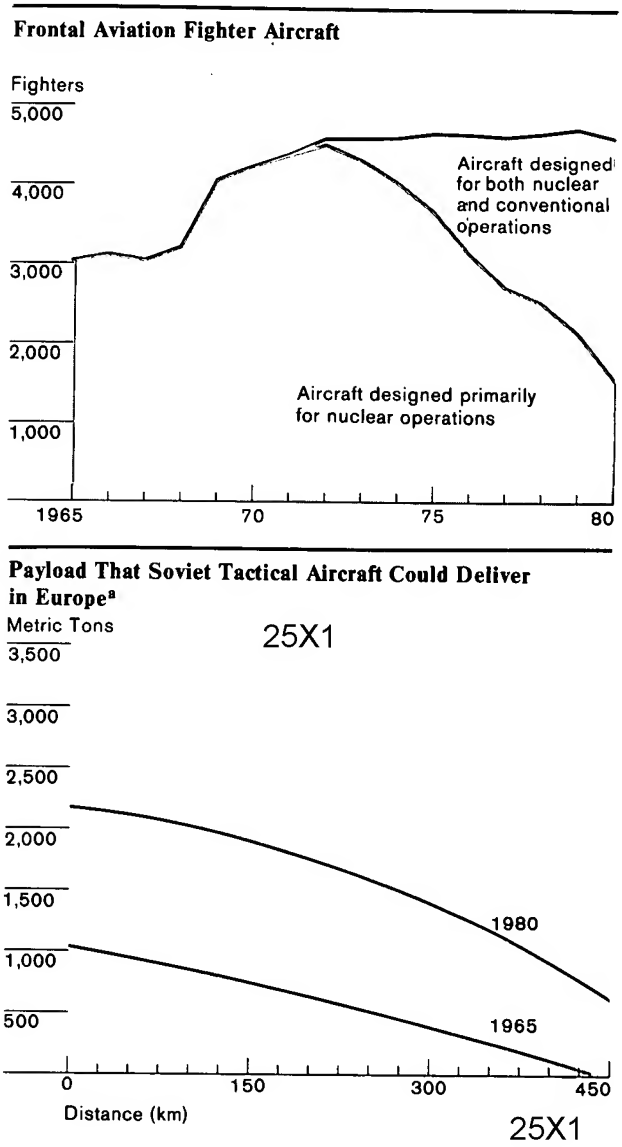
both conventional and nuclear war (see figure 17). The new family of "third-generation" tactical aircraft, which was developed during the late 1960s and early 1970s, answered the requirement for extended payload/radius and loiter performance by increasing aircraft size and adapting variable-geometry wing technology. Moreover, these aircraft incorporated more precise autonomous navigation capabilities and more sophisticated avionics. [redacted] 25X1

The modernization program began with fighter units in the early 1970s. MIG-23 Flogger B/G aircraft were introduced to replace earlier model Fishbeds. These newer aircraft now make up about two-thirds of the Frontal Aviation interceptor order of battle. [redacted]

Modernization of the fighter-bomber forces began four or five years later, with the introduction of the SU-17 Fitter C/D and the MIG-27 Flogger D. These newer fighter-bombers can carry at least twice the bomb payload of the older Fitter A and can deliver this payload with approximately three or four times the accuracy. [redacted]

Figure 17

Trends in Soviet Tactical Aviation Forces



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[a]This shows the maximum weight of weapons (missiles or bombs) deliverable in one sortie, as a function of distance. A sortie is assumed to include all of the Soviet tactical aircraft in Central Europe.

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[redacted]

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Tactical bomber units also began reequipping in the mid-1970s by acquiring the SU-24 Fencer A as a replacement for the YAK-28 Brewer.

The greatest portion of Frontal Aviation's growth during the 1970s was directly attributable to the creation in 1972 of a rapidly expanding attack helicopter fleet equipped primarily with the Hind. The rapidity with which the new attack helicopters were introduced into the force indicates that this is a high-priority program for the Soviets.

The impact that this modernization program had on the fortunes of the air forces was substantial. During 1965-79, the air forces participated in seven of the 10 most costly Soviet weapon acquisition programs: the Flogger interceptor/fighter-bomber (the largest Soviet procurement program of the last 15 years), the Hip/Haze helicopters, the Foxbat reconnaissance aircraft, the Fencer tactical bomber, the Backfire bomber, the Fitter fighter-bomber, and the Fishbed fighter. Those programs, in turn, resulted in a major shift in defense resources allocation by increasing the air forces' share of investment and operating expenditures from 18 percent in the late 1960s to a high of 26 percent in 1972 and 1976. 25X1

Ground Forces. Having expanded the Ground Forces during the late 1960s, the Soviets concentrated during the 1970s on introducing new and increasingly sophisticated land armaments, which increased the firepower and mobility of their theater forces. They also shifted the construction emphasis from basic facilities that directly support combat units to buildings that increase unit readiness and sustain combat operations:

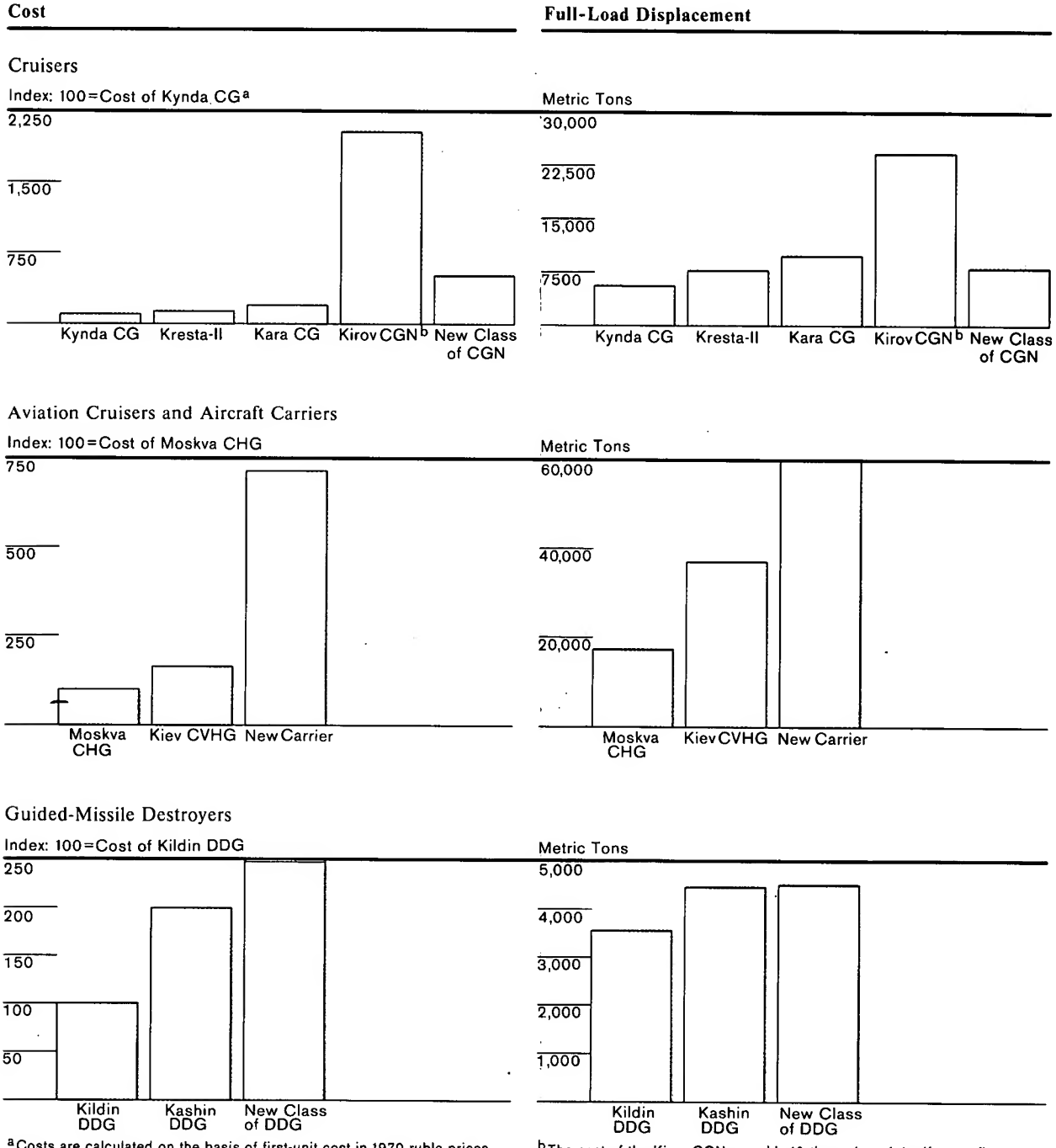
- Since the late 1960s, the number of tanks in Soviet tank divisions has increased from 313 to 322 and in Soviet motorized rifle divisions from 188 to 214.
- Two new tanks, the T-64 and T-72, were introduced. Both have larger caliber main guns than earlier tanks, with longer ranges and automatic loaders that increased firing rates and reduced crew size. They also have antiradiation liners to protect against nuclear contamination and laminated armor that is more difficult to penetrate than earlier, rolled homogeneous steel.
- At the end of 1979 the Soviet tank industry was expanding more rapidly than at any time since 1963, indicating that at least one new tank production program would begin before the end of 1981. 25X1
- A particularly significant development, which demonstrated the increased importance of conventional artillery in Soviet thinking, was the introduction in the early 1970s of new 122-mm and 152-mm self-propelled artillery. These artillery pieces were substantially more expensive than a towed gun and its prime mover, and more difficult to maintain. 25X1
- A program begun in the late 1960s to replace gun systems and older SAMs with more mobile SAM systems continued during the 1970s.
- At Ground Forces installations, the completion of construction of most of the basic facilities and the shift of emphasis from the construction of facilities that directly support combat units to the construction of support facilities and logistic infrastructure increased the Soviets' capability to conduct and sustain combat operations. 25X1

Because of these improvements and the continuing commitment of the leadership to balanced force modernization, the pattern in the Ground Forces' share of total investment and operating expenditures was relatively stable during the 1970s at about 20 percent. 25X1

Naval Programs. The upward trend in procurement expenditures for major surface combatants continued through the 1970s. This reflected the continuation of the Kashin guided missile destroyer program and procurement of the Kiev guided missile, vertical-takeoff-and-landing aircraft carrier, the Kresta II and Kara guided missile cruisers, the Kirov nuclear-powered guided missile cruiser, and the Krivak I and II guided missile frigates. 25X1

Over the past two decades, each new ship class has been more expensive than its predecessor (see figure 18). The increased cost of modern combatant ships reflects Soviet emphasis on large units, armed with antisubmarine, antiair, and antiship weapons. These

Figure 18
Trends in Unit Cost and Displacement of Soviet Large Surface Combatants



[a]Costs are calculated on the basis of first-unit cost in 1970 ruble prices. The first entry in each ship type has been indexed to 100.

[b]The cost of the Kirov CGN—roughly 10 times that of the Kara—reflects the large size of the ship, its costly nuclear propulsion system, and its array of weapons and sensors.

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ships incorporate extensive communication and electronic warfare systems and have improved capabilities for operation in distant areas. Soviet procurement expenditures for large surface combatants are currently about nine times the 1960 level. In 1978 they accounted for 25 percent of total ship procurement.

Soviet naval out-of-area operations peaked in 1974 and declined somewhat thereafter, averaging about six times that of 1965. They increased again in 1978 and 1979. In 1980 Soviet naval ships spent more than 45,000 ship days outside home waters—an increase over the previous peak set in 1974. Nearly all of the expanded activity was in the Indian and Pacific Oceans and in response to regional crises.

During the 1970s, the Soviet Navy demonstrated an ability to respond to crises by nearly doubling the size of its normally deployed naval contingents in the Mediterranean during the 1973 Middle East war and off East Africa during the Ethiopian-Somali war in 1977-78.

The expanded naval activity outlined above has been one aspect of a gradual evolution of Soviet military policy toward a more direct and assertive use of military power in Third World conflicts. This policy has involved the extensive use of Cuban combat forces for intervention in Angola and Ethiopia in the mid- and late 1970s and the outright employment of Soviet combat ground and air units in the invasion of Afghanistan in 1979—the first direct involvement of Soviet ground forces in a Third World conflict.

Space. During the 1970s, the full weight of R&D in the Soviet space program was muted. This muting effect was due, at least in part, to a series of setbacks the Soviets encountered in their efforts to develop larger and more complex space boosters. Many spacecraft programs related to those boosters were canceled or delayed. The failure to develop large space boosters, coupled with the success of the US Apollo program and of later US planetary missions like Viking, caused the Soviets to emphasize what they had left—Earth-orbiting space stations and other systems for military support.

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General Trends in Defense Expenditures

Growth in total Soviet defense expenditures slowed somewhat during the 1970s, averaging 4 percent annually as compared with the 6.5-percent average annual rate for the 1960s.

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This growth rate was about the same as that of the economy, and as a result, the military's share of Soviet GNP was a relatively constant 12 to 13 percent for most of the decade.

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In resource terms, RDT&E remained the fastest growing component of Soviet defense expenditures, suggesting that qualitative improvement has become increasingly important in shaping military spending. Outlays for RDT&E during the 1970s were double what they had been during the 1960s, and its share rose from 16 percent in 1970 to its present share of about 23 percent. A measure of RDT&E's continued growth is estimated annual construction and capital investment expenditures at Soviet military R&D facilities, which have been rising steadily since the early 1970s. Present levels are the highest since the early 1960s, when the Soviets were still completing an unprecedented expansion of their military R&D base.

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Slower growth in other components of defense, however, contributed to a lower overall growth rate for the 1970s. Expenditures for uniformed personnel, construction, space, and procurement grew substantially more slowly than during the 1960s. The average annual growth rate in military procurement, the largest component of spending, slowed in the late 1970s to under 3 percent. This reflected cycles in procurement (as several major weapons programs reached a low point) rather than signaling a new trend.

25X1

Table 3

Average Yearly Procurement of Major Weapons, 1971-80

	Average Number Per Year
Missiles	
ICBMs	210
MRBMs and IRBMs	100 [a]
SLBMs	150
Strategic SAMs	6,800
Spacecraft	72
Aircraft	
Medium bombers	20
Tactical fighters	685
Strategic interceptors	215
Transports	60
Helicopters	935
Combatant ships and submarines	
SSBNs	5
Attack submarines	6
Major surface combatants	6
Minor surface combatants	60
Principal land arms	
Tanks	2,455
Other armored vehicles	4,050
Artillery	1,050

[a] Includes 1976-80 only. SS-20 deployment began in 1977 after a hiatus in MRBM and IRBM deployments of more than a decade.

This slower rate of growth did not impact on the capabilities of Soviet forces. This is because military investment reached a level high enough to allow substantial modernization to take place within Soviet forces even under conditions of slower growth. Table 3 shows that the Soviets procured an impressive array of major weapons during the 1970s. 25X1

Moreover, at the end of 1979, floorspace at facilities used for weapon production was growing more rapidly than at any time since the mid-1960s. This would presage continued increases in defense spending during the early and mid-1980s, because historically there has been a close relationship between the completion of new facilities and an upswing in the rate of growth of defense spending as these facilities begin to produce new weapons. 25X1

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The Economic Setting of Defense

This section examines the economic environment within which the Soviet defense establishment developed over the last 30 years and the relationships between defense spending and various macroeconomic aggregates. For the most part, this discussion is presented in terms of Western rather than Soviet economic theory and measures. Its purpose is to provide a broad appreciation of the economic dimensions of the development of Soviet military forces rather than an in-depth analysis of the economic burden of defense.

Because this presentation is limited in scope, it should not be construed either as an exact portrayal of the Soviet perception of the economic burden of defense or as a definitive study of the potential trade-offs between defense and economic performance. Such a thorough analysis of the burden of defense is beyond the scope of this report. 25X1

Soviet Economic Performance in the Postwar Period

In contrast to most industrially developed countries, where productivity gains have been a key factor in economic growth, the USSR has relied more heavily on massive injections of labor and new fixed capital to support its growth in GNP. During the 1950s this policy resulted in rapid gains in output because of the low level of GNP in the early postwar period and the relatively high efficiency of new fixed investment in reconstruction and repair of war damage.

During the early 1960s, as the Soviets moved out of the reconstruction phase, highly efficient investment projects became more difficult to identify, and centralized planning and management of a burgeoning economy became increasingly cumbersome and inefficient. Productivity slowed, and capital-output ratios rose rapidly. Since the mid-1960s the Soviet leadership has groped continually for ways to stimulate growth in productivity. Failing in this, they have had little choice but to continue the large commitment of resources to investment if economic growth was to continue apace.

Thus, during the past 15 years, industrial and agricultural growth has been supported by average annual rates of growth in capital assets much greater than their growth in output. In addition to maintaining steadily larger annual flows of investment, Soviet planners have swelled the expansion of capital stocks by:

- Holding retirement of aging equipment to a minimum. 25X1
- Prolonging the service lives of technologically obsolete capital stocks through repeated extensive capital repairs.
- Continually expanding new construction projects, thus channeling the bulk of investment into buildings and structures rather than into new machinery and equipment, though the latter is the principal carrier of new technology. 25X1

Sustaining a rapid increase in total capital assets by these methods has impeded technological progress and productivity gains. Efforts to increase the quality and quantity of output and make better use of available resources continue to be frustrated by a backward technological base, inflexible production processes, and a cumbersome and inefficient system of planning and management. Moreover, military programs preempt capital equipment, trained labor, and materials that could be used in civilian production. 25X1

Additionally, future Soviet attempts to halt adverse trends in output and productivity growth must overcome resource problems quite different from anything experienced since World War II. In addition to the continuation of chronic difficulties related to low efficiency, several new problems beset the regime. The rate of growth of the labor force has decreased sharply because of the decline in birth rates that occurred in the 1960s. At the same time the costs of obtaining raw materials and semifinished goods have 25X1 25X1

risen sharply, as has the demand for technologically advanced finished products. In short, the economy is under increasing pressure to produce more and better products with declining resource increments at increasing costs. As a result, Soviet economic growth, which has been slowing gradually since the late 1950s, continues to fall. Lagging industrial production and two successive harvest failures have reduced the growth in GNP during the past two years to its lowest rate since World War II. 25X1

The Use of Economic Resources by Defense

Continually increasing defense expenditures, a trend that has been under way for more than two decades, have paid substantial dividends to the Soviet leadership in military capabilities and political prestige. The economic cost has been high, however, because the effort has entailed the use of scarce human and technical resources and raw materials. For example, we estimate that about 50 percent of all Soviet research and development manpower is engaged in military-related activity, which probably has an adverse effect on technical innovation in civilian sectors. 25X1

The Defense Share of GNP

The most widely used measurement of the proportion of a nation's economic resources taken by defense activity is the share of all goods and services purchased by the military establishment. It is customary to express this as the proportion of the value of total defense expenditures to GNP. The Soviet defense share of GNP has averaged about 13 percent over the past 20 years (see table 4):

- In the early 1960s, defense grew more rapidly than the economy, resulting in an increasing defense share of GNP. In 1963 and 1964, defense consumed 14 to 15 percent of Soviet GNP, the highest level achieved during the 20-year period. Over the five-year period, however, the average defense share was 13 to 14 percent.

- In 1965 a pattern developed of rather close correspondence between growth of the economy as a whole and growth of defense. During 1965-78, both grew at an average rate of about 4 percent annually. As a result of this phenomenon, a fairly constant 12- to 13-percent share of GNP went to defense.

- In 1979 defense was growing more rapidly than the economy and began absorbing a larger share of GNP—13 to 14 percent. This return to the relationship of the early 1960s was the result of the especially poor performance of the economy in 1979-80 and the continued growth of defense expenditures at better than 4 percent. 25X1

Table 4

Percent

Soviet Defense Expenditures and Economic Indicators

	1960-65	1965-80
Growth rates		
GNP	5	4
Defense	8	4
Average defense share of GNP	13 to 14	12 to 13

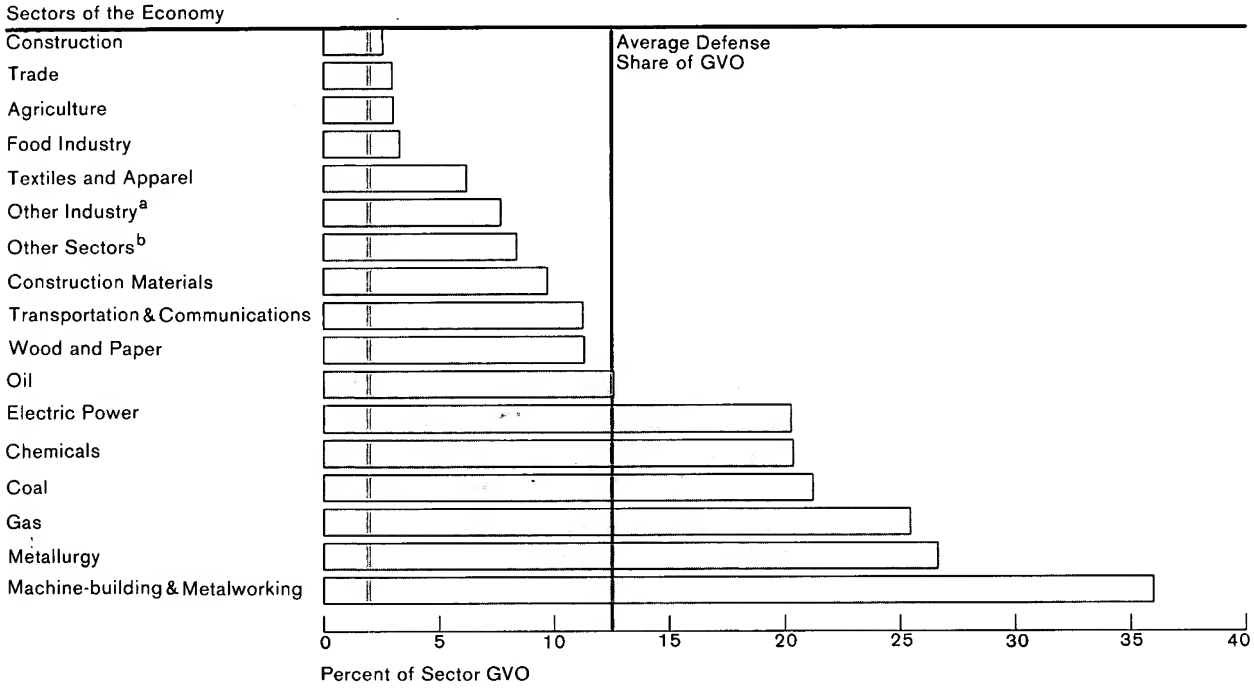
25X1

These patterns indicate that during 1965-78 the Soviets were able to sustain substantial improvements in their military forces at a cost to their economy which, while extremely high by Western standards, did not require an increasing share of total economic resources. 25X1

Sectoral Impact

The overall defense-to-GNP ratio does not convey the fact that the impact of defense spending varies considerably from one sector of the economy to another. Measurements of the impact on economic sectors can include both the direct and the indirect requirements stemming from military purchases. For example, in addition to the value of the coal purchased by the Ministry of Defense to heat barracks and other military facilities, the measurement for the coal sector can include the value of the coal required in all stages of industrial production—including metallurgical plants, armaments factories, weapon assembly plants, and supporting industries—to produce the weapons and equipment that are eventually purchased by the Defense Ministry. 25X1

Figure 19
Total Military Requirements as a Percent of Sector Gross Value of Output (GVO)



[a] Industrial sectors not classified elsewhere.
[b] Other sectors of the economy not classified elsewhere.

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We have made rough estimates of total (direct plus indirect) military requirements using the Soviet input-output tables and our estimates of the value of defense purchases from the sectors of the Soviet economy. Using a 17-sector reconstruction of the 1972 Soviet input-output table,[9] we assigned about 75 percent of total defense expenditures to individual input-output sectors.[10] The remaining 25 percent of total military expenditures represents the value of military pay and other services, which are not included in the input-output analysis. A computation with the input-output table determined the total requirements from each sector implied by the defense expenditures. 25X1

Figure 19 shows the total military requirements as percentages of the gross value of output (GVO) of each sector. According to our estimates, the defense share of total GVO of all sectors in figure 19 is about the same as the share of GNP going to defense (12 to 13 percent) in 1972, the year of the input-output table.

[9] We use a 1972 input-output table for our calculations because it is the latest Soviet table available to us. The table depicts the technological structure of the Soviet economy for that particular year. The relationships that describe the inputs required by a sector for each unit of its output change over time, but in general they do not change rapidly. Therefore, the tables showing these relationships retain their usefulness for analytical purposes over a period of years. The relationships in the 1972 table can be considered as approximations for an indefinite number of years before or after the year of the table.

25X1

[10] We estimate that about 70 percent of military purchases of materials consist of weapon systems and other hardware procured from the machine-building and metalworking sector, and about 30 percent are from the other sectors.

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The defense shares of many individual sectors, however, differ markedly from the aggregate proportion.

The impact of defense is greatest on the machinery, metals, energy, and chemical industries. These sectors are all key to economic growth, and there is a great deal of interdependence among them. The machine-building and metalworking sector is singled out continually by Soviet leaders as the mainspring of economic development. This sector produces military hardware and is also the source of most machinery produced for capital investment. The largest supplier of the machine-building industries is the metallurgical sector, where ferrous and nonferrous ores are mined and refined and all types of metals—from sheet and rolled metal to wire nails and rivets—are produced. The energy sector includes industries to which the Soviets have always given special attention, and the chemical sector has received significant investment allocations at least since the Khrushchev era.

It is clear that in these key sectors the total military requirement is disproportionately high compared with the 12- to 13-percent defense share of GVO and GNP. Further, much of the military demand represents indirect rather than direct military purchases from industry. For example, military hardware is procured directly from machine building and metalworking, which draws heavily from metallurgy, which, in turn, demands large inputs from the coal sector. Thus, large indirect military demands are created on the metallurgy and coal sectors, although direct military purchases from those sectors are quite small.

We do not know whether the Soviets have made an analysis of the economic impact of their defense effort along these lines. They do, however, have a penchant for using GVO data in their economic analyses and reporting, and this kind of sector analysis provides results that share that frame of reference. In any event, there is no reason to doubt that they are aware—through whatever method—of the principal conclusions we draw from our analysis: that the impact of defense is heaviest on the areas of the economy that are important to economic growth and that defense vies with other strong claimants for the output of those key sectors.[11]

25X1

[11] S. A. Sarkisyan and D. E. Starik, in their work entitled *Ekonomika Aviatsionnoy Promyshlennosti* (Moscow, 1980, pp. 78-84), emphasize the necessity of recognizing both direct *(pryamyye)* and indirect *(kosvennyye)* requirements in the context of resource planning for the Soviet aviation industry. The method of sectoral analysis described in that publication is essentially the same as the input-output method applied in this section to defense requirements.

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Prospects for Soviet Defense Spending in the 1980s

Economic Prospects

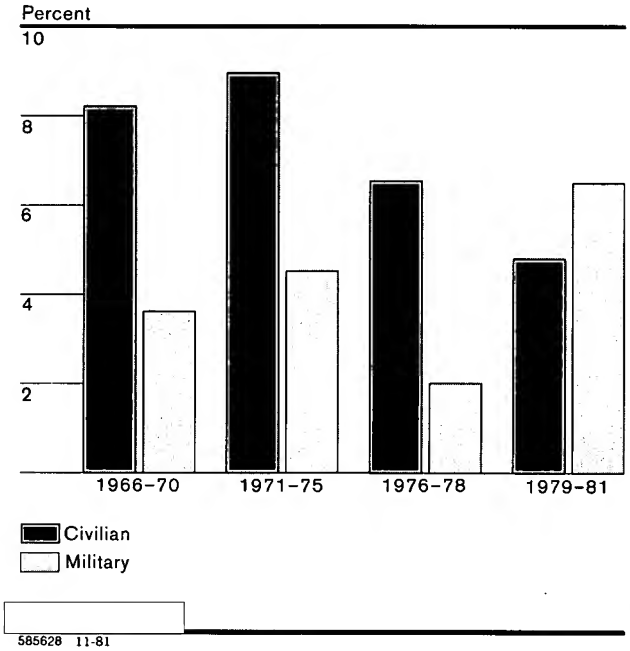
In their 11th Five-Year Plan (1981-85) the Soviets are confronted with an economy that has performed very poorly for five years and holds little promise of any improvement during the 1980s. Halfway through 1981, Soviet economic growth was running behind the previous year's poor showing in almost every sector. The problems besetting the economy are many and varied. Some are of recent vintage; others are of a more longstanding and fundamental nature:

- Agricultural performance over the past few years has been a disaster. Consecutive harvest failures in 1979 and 1980—unprecedented in recent Soviet history—have left Soviet consumers facing widespread shortages of meat and other quality foods. The 1981 grain crop is expected to be smaller than 1980's, and Moscow will have to import record quantities of grain and other farm products just to avoid deterioration in the daily diet.

- Industry's average annual growth rate of 3.2 percent in 1979-80 was a continuation of the slump that began in the mid-1970s. Shortfalls in the production of key industrial commodities—especially steel, oil, coal, construction materials, and chemicals—contributed to an abrupt slowdown in the production of investment goods and virtually halted growth in construction activity. Shortages of several key industrial commodities will probably become more severe during the early 1980s.

- Growth in civilian machinery output has now shrunk to its lowest level in three decades and, for the 1979-81 period, military machinery output grew faster than its civilian counterpart (see figure 20). Because of this trend, Soviet investment plans for industrial modernization will be severely constrained.

Figure 20
Growth Rates of Soviet Civilian and Military Machinery Output



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- Labor productivity has been slowing sharply in all economic sectors. Most of the causes of the past slump in labor productivity growth will persist and exert even more influence in the 1980s.

- Growth of Soviet energy production is expected to continue to slow.

- The natural increase in the working-age population will decline from about 2 million persons annually in the 1970s to only about 400,000 per year by the mid-1980s.

25X1

Table 5

Soviet GNP and Defense Spending Increments

	1960-65	1980-85 (Projected)
Cumulative GNP increments (billion 1970 rubles)	65	69 [a]
Cumulative defense spending increments (billion 1970 rubles)	12	15 [b]
Defense increments as percent of GNP increments	18.5	21.5

[a] Annual GNP growth projected at 2.5 percent.
[b] Annual defense growth projected at 4 percent.

25X1

If these trends continue, the annual increments to GNP over the next five years will not be large enough to support the needed increases in investment and consumer welfare while at the same time maintaining continued growth in defense spending at historical rates and providing greater support to Eastern Europe. 25X1

If defense spending continues growing at an annual rate of 4 percent, then during the 1980s it would be growing at a faster rate than the economy as a whole, reversing a long-term trend that began around 1965 in which defense and the economy grew at about the same rate. This pattern would be similar in some respects to the pattern of the early 1960s, when defense spending was growing more rapidly than the economy and economic growth and productivity were declining. 25X1

Table 5 compares the ruble value of the increments in GNP and defense spending during the two periods. The ruble value of the increment to GNP that we project over the 1980-85 period is not much larger than the total GNP increment that we estimate was achieved during the first half of the 1960s. Defense, growing at its present rate, will take an even larger share of the GNP increment during 1980-85 than it did during 1960-65. The Soviet economy during the 1980s will be much different from the economy of the early and mid-1960s, and the problem of accommodating increments in defense spending that take as much as one-fifth of total increments to GNP may now be more acute. 25X1

Table 6

Soviet GNP, Population, and Industrial Capital Stock

	1960	1979	1979/1960 Ratio
GNP (billion 1970 rubles)	232	518	2.2
Population (million persons)	214	263	1.2
Industrial capital stock (billion 1973 rubles)	100	514	5.1

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The data in table 6 suggest the relative size of the economy and some of the sources of the increased demand that will intensify competition for the GNP dividend in the 1980s. The heightened expectations of a population that is about one-fourth larger than it was in 1960 has significantly increased demands for construction, food, and transportation—apart from whatever expectations may have been created for other consumer goods. The historical emphasis on investment in industrial plants and equipment has caused a very large increase in the capital stock of industry since 1960—resulting in a much larger industrial base—but much of this stock is aging and in critical need of renovation and modernization. The resources that are needed to satisfy these and other demands—for example, for new products to promote energy development and to substitute for labor—are also those that are essential for new defense production. Consequently there will be increased competition for such resources in the 1980s. 25X1

Simulations were conducted using a macroeconomic model of the Soviet economy that took account of the impact of labor and energy shortages as well as defense spending increases of about 4 percent through 1985 and slightly less afterward. These simulations suggest that Soviet GNP growth will slow to an

average annual rate of 2 to 3 percent through 1985 and to less than 2 percent from 1985 through 1990. The defense share of GNP, which was 13 to 14 percent in 1980, could be a percentage point higher in 1985 and could approach 20 percent by 1990.

More importantly, however, the defense share of the annual increment to GNP could increase from about one-fifth now to between one-fourth and one-third in the mid-1980s and to as much as three-fourths by the end of the decade. This would drastically reduce the ability of the Soviet leaders to allocate additional resources to investment and consumption. It would also erode the annual growth dividend that has been so important in the past in easing political tensions that arise from the competition for resources.

Soviet economic growth is relatively insensitive to changes in the growth rate of defense spending. For example, a reduction from its present rate of 4 percent to no growth between now and 1990 would alter the growth of GNP by only a small amount. This is because changes in defense spending cannot make up for the deficiencies in labor and energy that the Soviets will face.

A change in defense spending growth would, however, alter the distribution of economic resources, even if the overall rate of economic growth remained largely unchanged. Given the slow rate of growth that we project for Soviet GNP in the 1980s, almost any acceleration in the growth of defense spending would have considerable impact on the share of economic output available for civilian uses. A major defense increase could bring per capita consumption to stagnation or to a measurable decline. Such a decline would influence popular morale and labor productivity, with serious political and economic consequences. It is conceivable, therefore, that the Soviet leaders could see some reduction in the growth of defense spending as an attractive element of a policy program, even though its specific contribution to economic growth would be small.

Thus, as economic conditions worsen, merely maintaining past rates of growth in defense spending will become increasingly difficult—both economically and politically—for the Soviet leadership. However, we have yet to see any evidence of a shift of resources away from the defense sector:

- Current indicators of weapons program activity point to continued growth in defense spending at about 4 percent a year through at least 1985. 25X1
- Our information on the 11th Five-Year Plan (1981-85) suggests that the leadership has decided to continue the priority of defense in spite of growing economic problems. 25X1

Indicators

We are monitoring a number of indicators of future defense programs to identify potential adjustments in defense spending. Evidence of weapons production and testing as well as construction growth at defense industries and military R&D facilities points to continued real growth in defense spending during the 1980s. 25X1 25X1

Current Production

We estimate that the Soviets currently have in production some 190 major weapon and support systems—military aircraft; principal land arms; missiles and military space systems; naval surface combatant, mine warfare, and amphibious ships; and submarines. This total represents a slight increase in the annual average since the early 1970s. 25X1 25X1

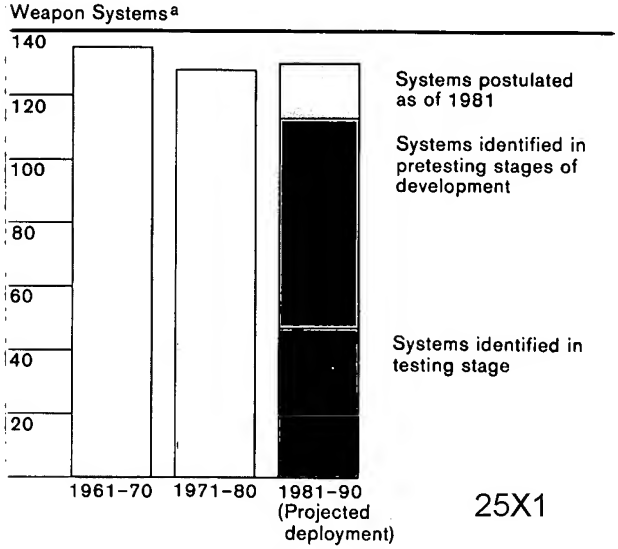
Nearly three-fifths of the programs concerned have entered production in the last five years, and most of these will continue to be produced through the early 1980s. For most major weapons, annual production rates have remained stable or have increased since the mid-1960s, and we see no evidence that production rates are being cut in response to economic constraints. 25X1

Floorspace Expansion at Defense Industries

Historically, there has been a close relationship between the completion of new facilities at weapons production plants and an upswing in the growth rate of defense spending. As new floorspace becomes active, the new weapons produced boost procurement expenditures, the largest component of defense expenditures. 25X1 25X1

At the end of 1979, completed floorspace used for weapons production at key facilities was growing more rapidly than at any time since the mid-1960s. This rate of expansion foreshadows the start of production of many major weapons that are now in the late stages of R&D. Expansion projects reaching completion in the next year or two should cause Soviet defense spending to continue to grow at about its historical rate of 4 percent for the next several years. Moreover, construction activity now under way suggests that the Soviets have begun to make resource decisions that would lead to continued growth in defense spending through the remainder of the 1980s. If construction continues at normal rates, the new floorspace will become active in production programs between 1985 and 1990. The new weapon production programs undertaken at these new facilities would spur the continued growth of major weapon procurement—and therefore total defense spending—into the 1990s.

Figure 21
Number of New or Modified Soviet Weapon Systems Deployed, by Decade



[a] Includes military aircraft, missiles, naval ships (surface combatants, mine warfare, and amphibious), submarines, military space systems, and principal land arms (tanks, armored vehicles, artillery, and antiair weapons).

Weapon Systems in Test and Development

The number of weapons the Soviets now have in testing and earlier stages of development is consistent with the levels we have observed over the past 20 years (see figure 21). We estimate that Moscow could introduce some 130 new or modified major weapon and space systems during the 1980s. This is about the same number as were introduced during the 1960s and 1970s.

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Thus, the military systems we have already identified in development and production, if produced at historical rates, would sustain the growth of Soviet defense spending at about the average annual rate of 4 percent through at least 1985. The number of systems currently identified in development and slated for production during 1981-90 corresponds closely to production levels achieved during the 1970s.

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The 11th Five-Year Plan

The preparation of the 11th Five-Year Plan (1981-85) apparently involved the Soviet leadership in particularly difficult decisions on the allocation of resources between defense and the economy. The draft guidelines, published in December 1980 and adopted at the 26th Party Congress in March 1981, contained only about half as much statistical data as the two previous plans. The data cutback was especially pronounced in those activities most important, but troublesome, to the leadership—energy, agriculture, and transportation. Although the reduction in data is in line with the trend to curtail the volume of published statistical information evident since the mid-1970s, the absence of concrete figures for several key goals probably reflected delays, uncertainties, and possibly conflicts in Soviet decisionmaking.

Nevertheless, the plan guidelines placed the greatest emphasis on the development of heavy industry and agriculture, with the highest growth targeted for those branches of heavy industry most closely tied to the military. Moreover, our analysis of these targets indicates that there is room in the plan for continued growth of defense spending at historical rates. Thus, whatever anxiety the leadership felt about the worsening plight of consumers was not enough to cause a significant reallocation of resources in their favor.

The preparation period for the 1981-85 Five-Year Plan coincided with a number of events that probably gave added weight to military arguments for additional resources:

- In the fall of 1979, when the pace of work on the plan was increasing, Soviet hopes for SALT II ratification diminished. During this period, the Soviets became increasingly concerned about the prospect of deployments of long-range theater nuclear forces in Western Europe and an improving US relationship with China. Over the ensuing year, their view of the likely strategic environment in the 1980s probably became more threatening.

- The invasion of Afghanistan in December 1979, which the Soviets viewed initially as a "limited" and "temporary" operation, has involved them with a major commitment of political and military prestige in a situation that has no short-term solution. All indicators point toward a continued Soviet military presence there.

- The political and economic deterioration of Poland during 1980 proved particularly troublesome for the Soviets. It threatened Warsaw Pact effectiveness and caused new tensions in East-West relations. 25X1

Exacerbating these factors have been the announced military policies and increased defense spending goals of the new US administration, which reflect an intent to carry through with a broad-based military buildup directed primarily toward the Soviet Union. 25X1

In this connection, a deputy chairman of the Soviet State Planning Committee (Gosplan), N. P. Lebedinskiy, alleged to a former US budget official in May 1981 that the Soviets were making eleventh-hour changes to their 1981-85 economic plan to accommodate "large increases" in defense spending. He further noted that those changes took place after February 1981, required important revisions in plan targets, and were intended to counteract planned increases to the US defense budget. 25X1

By virtue of his positions as a deputy chairman of Gosplan, a member of Gosplan's collegium, and chief of Gosplan's main computer center,[12] Lebedinskiy probably would have access to aggregate defense spending data and therefore be knowledgeable about the impact of increased defense activities on various economic sectors. He did not describe the scope and magnitude of the increases, but it was evident to Lebedinskiy's interlocutor (who has known him for over a decade) that the increases he alleged the Soviets to be making were substantial. 25X1 25X1

There is a political context to Lebedinskiy's remarks. In mid-1981, Soviet officials, in both public and private statements, attempted to communicate to the US Government both Moscow's concern over a US military buildup and Soviet determination to keep pace with an expanding American defense effort. In

[12] Lebedinskiy also claimed that he had recently been appointed deputy director of Gosplan for all economic planning. We have not been able to confirm this. 25X1

addition, Soviet commentators have alleged that prospective increases in defense spending indicate that the United States has embarked on a policy course aimed at upsetting the existing strategic balance and at achieving military superiority—which, they stress, the USSR will not allow.

In this connection, President Brezhnev emphasized in June 1981 that the Soviet leadership "cannot shut its eyes to all this and cannot but draw appropriate conclusions for itself." And, he warned, "the Soviet Union will find a way to react rapidly and effectively to any challenge. We must do so." Also in June, Defense Minister Ustinov asserted that the USSR would not permit anyone to upset the established equilibrium of strategic-military forces in the world and vowed that the USSR would give an "effective response" to any and all challenges in the arms race.

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Thus, Lebedinskiy's words may have been intended to serve as a purposeful message to the US administration of Soviet resolve to compete, if necessary, in an escalated arms race and an additional pressure tactic to prod Washington into resuming arms control talks.

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Beyond these political aspects, his remarks may also have reflected some of the realities of the Soviet defense budget process and the direction of the internal debate over military requirements and economic policy for 1981-85. The draft guidelines suggested that the 11th Five-Year Plan remained substantially unwritten beyond 1981 and that difficult problems of choice, priority, and policy had not been resolved by the leadership in several critical areas. Nevertheless, Lebedinskiy's remarks implied that as of February 1981 the Soviets had made some preliminary decisions on defense funding that subsequent military lobbying disrupted.

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Prospects for an Accelerated Soviet Defense Effort

In the context of preparing a five-year plan, "large increases" in the defense effort most likely would be related to increases in the production and procurement of military hardware. The record of Soviet defense spending between 1965 and 1980 indicates that the procurement of new weapons and equipment constituted about half of total defense spending and was the main factor driving it upward. Such increases could be effected by both short-term and longer term options.

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Short-Term Options

Opportunities for immediate production increases could well be limited by chronic bottlenecks in the supply of components and materials. We know, for example, that the Soviets are having difficulty making timely deliveries of critical components to meet current production levels of strategic missiles. Soviet attempts to achieve even modest increases across a broad range of systems probably would encounter shortfalls in supplies of critical components and materials.

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For the short run, therefore, Soviet adjustments to increase military goods would probably be constrained to two courses of action:

- Modest increases in production rates for some selected systems already in or about to enter production. This option probably would not cause a significant increase in the growth of defense spending.

- Implementation of partial industrial mobilization. This is an extreme means of increasing production of critical weapons and equipment and is normally reserved for emergency situations. Prolonged industrial mobilization carries with it severe economic dislocations.

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Longer Term Options

In the longer term, one way the Soviets could accelerate the pace of their military buildup would be to increase their capacity to produce military systems by augmenting their plans for investment in defense industries. Accelerated investment in the defense industries would reduce the availability of investment resources to other sectors of the economy during the current five-year period and have the effect of substantially increasing production rates for systems slated for production during the mid- and late 1980s.

Increases in production, in turn, would drive up the growth rate of defense spending in the latter half of the decade and beyond.

During the next few years, the Soviets could begin construction of new final assembly facilities in addition to those that were included in the draft five-year plan. Simultaneously, expansion of production capacity at key component production facilities could relieve chronic bottlenecks that currently limit increased production of many military systems. These added new facilities probably would come on stream during the late 1980s.

A second option for the long term would be to undertake new weapon development programs in addition to those already in train. Initiation of these programs would increase the number of weapon options available to Soviet leaders in the long term, with only minor immediate impact on defense spending. Development programs do not begin to consume significant resources until full-scale engineering development begins, several years into the program. Most new development programs initiated in the 1981-85 period would not enter production until the late 1980s or early 1990s and would, therefore, not impact on the current five-year plan.

Planning Contingencies

Plan adjustments to accommodate "large increases" in defense spending could reflect Soviet planning for an anticipated accelerating arms competition with the West as well as for the Polish crisis and its potential impact on Soviet security interests in Eastern Europe.

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Recent Soviet commentary has linked together alleged Western efforts to subvert socialism in Poland and broader Western initiatives aimed at weakening the USSR's strategic position. The connection the Soviets make between these two issues is their perception of coordinated Western efforts to upset a historically established balance—in the case of Poland, the political-military balance codified by the wartime agreements and reaffirmed in the 1975 Helsinki accord; in the case of Western arms programs (such as the NATO decision to modernize its theater nuclear forces), the balance that has allegedly evolved between Soviet medium-range missiles and US forward-based systems. In any event, in considering future requirements for war in Europe, the Soviets are likely to view any new operational problems posed by the modernization of NATO's theater nuclear forces as only being additionally complicated by the questions now raised about Poland's future role in Warsaw Pact plans.

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Events in Poland, at a minimum, have caused the Soviets to plan against the progressive weakening of a country that has been assigned responsibilities of critical importance to the Warsaw Pact. In the event of a war in Central Europe, Poland is responsible for forming and commanding the northernmost front of Pact forces and for supporting and securing the wartime movement of Soviet troops and supplies through its territory. Poland also maintains a defense industrial base that not only produces a broad range of weapons and military equipment for Polish forces but also helps equip the armed forces of other members of the Warsaw Pact

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To hedge against the reduced reliability of Polish forces, the Soviets may be anticipating an expanded role for their own forces in Poland during the 1980s and, in this connection, may have decided to increase production of some hardware for their ground and tactical air forces. Such increases, however, would probably be small and have little effect on the growth of defense spending.

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It is unclear to what extent, if any, the Soviets would factor the impact of military intervention in Poland into a five-year economic plan. Although an intervention could be costly, the cost of an invasion would depend on the size of the force, the type of military operations conducted, and the intensity and duration of Polish resistance. Consequently, the Soviets probably have not been able to calculate with any degree of certainty the specific costs and consequences of an invasion in military, much less economic, terms.

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We believe it more likely, therefore, that adjustments to accommodate large increases in Soviet defense activities would be primarily directed against a perceived accelerating arms competition with the West. The Soviets would probably not view increases to improve their military position vis-a-vis the West as requiring the economic sacrifice that industrial mobilization entails. They are probably still uncertain about the long-term threat implicit in the US buildup, and in any event they recognize that the United States will not be able to quickly turn around the imbalances it now perceives. Having this perspective, the Soviets would probably pursue a combination of near-term production increases for selected weapon systems and longer term increases in investment and developmental activity to hedge against what in their view is an increasingly uncertain strategic environment.

We are confident we would detect indications of large increases in major Soviet weapon development and production programs well before such weapons became operational with Soviet forces. The best indicators would be higher levels of weapons testing activity and increased capital construction at key weapons production facilities. Specific testing programs and plant expansion projects would probably provide several years' advance warning of changes in the mix and levels of weapons the Soviets intend to acquire later in the decade.

If the Soviets pursued this course, defense spending growth would probably increase above historical rates during the middle and late 1980s and beyond. This decision to increase the long-term priority of defense, however, would have an impact on the Soviet economy in the 1981-85 period. 25X1

Economic and Social Impacts of an Accelerated Soviet Defense Effort

To the extent that any plan revisions increased investment in defense industries, investment in some civilian sectors would suffer. Both heavy industry and agriculture have powerful patrons in the political leadership, and the priority needs of energy, machinery for industrial modernization, and transportation could make it difficult to cut allocations in these areas. Consequently, investment in such areas as consumer durables, services, housing, and machinery and equipment for the processed food and soft goods industries would be likely primary candidates for cutbacks, with high-priority civilian areas being secondary targets.

Cuts in the consumer sector, however, could have two unpalatable consequences. They could worsen the already poor prospects for improving labor productivity and could increase worker discontent. 25X1

Moscow is counting heavily on large gains in labor productivity to meet the economy's output goals. Indeed, the plan directives currently stipulate that 90 percent of the growth in industry and all of the growth in agriculture must come through increases in productivity. Without some improvement in consumer welfare, chances of generating the large productivity gains implied in the 11th Five-Year Plan will be much reduced. 25X1 25X1

Labor unrest would be even more unpalatable to the leadership than lagging productivity. Food shortages resulted in scattered work stoppages in 1980, and reports of strikes have surfaced again recently. Some midlevel party officials admit to a sense of isolation from the working class, and concern over the Soviet workers' mood has grown since the Polish crisis began 25X1 25X1

The Soviet leadership is sensitive to the social instability that could arise from increasing consumer dissatisfaction and to the impact of this dissatisfaction on labor productivity. There will be pressures for both reasons to allocate a greater share of output to civilian consumption in the 1980s at the expense of either investment or military spending. Serious social instability could force the leaders to reassess their economic priorities in favor of the consumer. Short of this, we believe they will be inclined to adopt the current mix of cosmetic concessions, short-term fixes, and patriotic appeals and, if necessary, to adopt repressive measures to ensure both domestic control and the continued growth of their defense effort.

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